

HOTTEST ISSUE EVER!

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Radio Control **CAR ACTION**

THE WORLD'S PREMIER R/C CAR MAGAZINE

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ON THE COVER: Top: DWA's 1/4-scale motorcycle. Center: WCM's 1/4-scale Grand National car. Center top: RACO's prototype 1/4-scale Indy car. Bottom: 1/10-scale Indy car Concours lineup at Thunderdrome in Encino, CA. All photos by Steve "Smitty" Pond.

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EDITORIAL

by CHRIS CHIANELLI

A\$5,000 PURSE! That's what the winners of the A-Mains split at the King 8 Super Nats; not bad for an event that's only two years old! With the introduction of approximately 12 new 1/4-scale cars, ranging from New Era's Corvette to a Gambler sprint car manufactured by none other than Edelbrock, 1989 should go down in history as "the year of the pull-start car." There's even a rumor of a stadium racer on the horizon!

Quarter-scale cars have tremendous scale appeal, both in appearance and performance; they have very reliable, good-idling engines and get great gas mileage. Oh yes, three new 1/4-scale Indy cars are on the way—my favorite type (for whatever that's worth!).

While on the subject of Indy cars, the Encino R/C Thunderdrome, sponsored and organized by McAllister Racing and Dan's RC Stuff, was a decisive success, and you can read all about it in this issue. This event was held on a high-banded velodrome (bicycle track) with 300-foot straightaways; it isn't surprising that Kent Clausen's 1/10-scale Associated prototype road car ran at an unprecedented 57mph! Clausen's car sported an Indy body; in fact, most of the cars did, and that's what made this event unique. Although stock cars and other classes were featured, this affair focused on the open-wheeled animal—the Indy car.

Also in this issue, Mike Lee covers a full-scale GTP race at San Diego, CA. These sleek GTP racers add yet another dimension to R/C, and I'm sure they have great potential for growth, because by using any of the available road chassis, you can have your very own GTP racer.

I'll take this opportunity to welcome aboard a new writer, Wally David, who (appropriately) covers an on-road RC10 conversion.

Before I sign off, I'd like to address a few distressing letters I've received that affect us all. Dennis Greive of Bridgeton, MO, writes, "I'm 15 years old, and I can sum up being a novice car builder in two words: *It's impossible!* I've had it up to here with having a fixed budget and trying to compete with people who have \$1,000 or more invested in a car! I can't compete with them. The R/C industry is about to lose a consumer." Jason Roca of Marysville, WA, writes, "I'm 13 years old and have found that the usual winners are the men with more money; not too many kids ever win." Trinity has organized a Sportsman Cup Race, and I'm proud to say that RCCA is a co-sponsor; however, this is only a start. The industry and local clubs had better start considering this situation a high-priority problem to be solved now, or we're all going to lose. These letters from Dennis and Jason are representative of literally hundreds we've received.

On the brighter side, next month's issue is our Monster Truck Special. All I can say is, *don't miss it!*

Message from the Ayatollah of Radio Controlla: "Take no prisoners!" ■

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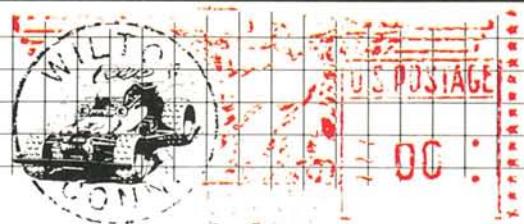
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Letters



WHERE TO WRITE TO US

If you're writing to the editors (and we'd love to hear from you), please be sure to address your letters to "Letters" *Radio Control Car Action*, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, Illinois; other mail addressed there must be forwarded to Connecticut, which leads to long delays.

Beyond Stock Motors

I've been reading the response to Mr. Provetti's idea concerning stock-class racing and motors. I agree 100 percent, but I'd like to see the class structure changed so that the cars themselves have to be closer to stock. Even at the local level, the winners at many events today no more resemble stock R/C cars than a double-A fuel dragster resembles a Volkswagen.

Graphite chassis, el supremo \$80 shocks, longtallo shock towers, mucho macho chassis stiffeners, wicked wide front-end wideners, unobtainium hinge

pins, positively positive peewee ball drives, hydraulic-driven transmissions, super souped-up sock-it-to-'em motors... why, for a mere investment of \$600 (minus electrics, of course), you can have the ultimate *stock* Grasshopper! (Well, it *does* come with a Grasshopper servo saver.)

WILD BILL CARR
Watertown, NY

Wild Bill, we agree: There should be some type of off-road production class that only permits the installation of ball bearings, a wound resistor-type speed control and after-market tires (on stock rims). The cars should be limited by retail price and closely monitored to keep the cost of racing down. Let's see if the new ROAR president will address this problem.

RH

Radio Mix

Totally rad mag, dudes! I'd like to know if a Cirrus Baja 250 transmitter will work with a Kyosho Pulsar receiver and servos, especially the R/S system.

Also, which LeMans motor would work best in a Tamiya Boomerang?

Thanks a million!

DANNY ZEMCIK
Shevlin, MN

Danny, on very few occasions has there been any success in using another manufacturer's receiver on a radio system. If and when it does work, it's usually a stroke of luck. It would be best to buy the complete Kyosho R/S system if you plan to build something that requires a system of this small size. Kyosho motors that would work well in the Boomerang include the 480 Gold and the 240SB or an 18- or 19-turn motor from one of the other popular motor manufacturers.



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You're welcome a million!

I hope you don't plan to use the Kyosho R/S system in your Boomerang. It would burn it up in a second!

SP

In Search of a Cutlass

I've been reading your magazine for about a year, and you're the best! I love all the hop-up ideas for the monster trucks, and I also liked the truck Shoot-out. I own a Blackfoot that I've decked out with your help. Now I need a little more help, if possible.

I was thinking about getting into asphalt racing and want to build my own racer from the ground up. I've seen articles and advertisements for everything I need, except the body. I know there are a lot of manufacturers of Lexan bodies, but I was wondering if there's a company that has or could

make a $\frac{1}{10}$ -scale replica of a '68 to '72 Cutlass. I own a '68 and would really love to have one R/C size. I figured you'd be the only ones who could help. If you could print a reply or send a response, I'd be eternally grateful. I'd even consider giving you my first born!

Keep up the excellent work and don't change.

BILL POORE

Bill, we'll settle for your gratitude; you can keep your first born.

While I'm not aware of any '68 to '72 Cutlass bodies on the market, why not check out Parma's 1969 Chevelle? Since GM used the same body molds for both the Chevelle and the Cutlass, you might be able to do the same thing. By reworking the front end of the Chevelle, you could capture the Olds look.

RH

Eagle-Eye Winner

You have the greatest magazine on the market. I love your Departments, especially "Inside Scoop" and "Pit Tips." I also like the features about tricks for the RC10.

Now, about that "Eagle-Eye-of-the-Month Award": I found it! In the January '89 issue, it's on page 82 in the top center. That's not just *any* ordinary Optima Mid, but a *Turbo Optima Mid SE*. That's the only error I found after looking over the magazine 10 or 12 times, so if that's not it, you hid it really well. Keep up the good work!

WERNER FREY

Peachtree City, GA

Congratulations Werner, that was it! Yours was the eighth correct answer. Watch for your free RCCA decals.

CC

(Continued on page 10)



Likewise, Pro-Line accessories, from wheels to bumpers to bodies, have what it takes to zero in on the finish line.

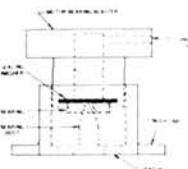
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Letters

Cruisin' for a Bruisin', Part II

I have some questions regarding your article on the Monster Truck Shootout in the May '88 issue. I'm interested in the MRC Tamiya Bruiser. I was told by a friend who works at my local hobby shop, Allied Hobbies, that the Bruiser could reach speeds of 40mph with a 6V 4000mAh battery. I had read your article that said with a 7.2V battery the Bruiser could only go 10.33mph. I'm confused, because the article didn't say if the Bruiser was in high gear. If it was in high gear, is it possible for the Bruiser to go 40mph with the 6V pack?

BRIAN DEAROLF
Royersford, PA

Brian, the Bruiser couldn't do 40mph going downhill with a 70mph tail wind—especially with a 6V battery. Where did your "friend" at Allied Hobbies get his information? As any knowledgeable hobby shop employee will tell you, the mAh rating has no effect on how fast the car (or in this case, the truck) will travel. What will effect speed is the voltage, so your friend was even more mistaken to think that the 6V would move the truck faster than a standard 7.2V pack. The only thing gained from the 4000mAh pack is running time. The Bruiser we used in our Monster Truck Shootout was running a 7.2V pack with the transmission in high gear when we recorded the speed of 10.33mph. If you want more speed from the Bruiser, you may consider running extra cells, e.g., an 8- or 9-cell battery pack (any more than 8 cells would require an electronic speed control rated for that). You may also want to consider taking your business elsewhere. If the people at Allied Hobbies tell you that a Bruiser can go 40mph when in fact it might have a hard time going that fast if you threw it off a building, their experience in the R/C business falls far short of what someone you look to for guidance should know or understand.

SP

Truck Tyke

I'm 11 years old and am interested in radio-control monster trucks. I have a Big Brute and was wondering if I could

put two 7.2V batteries on it to make it last longer. If there's any way, could you tell me?

One more thing: Could you have a shootout featuring Clod Buster and Double Dare? Your magazine's the best.

JEFF WISSMILLER
LeRoy, IL

Jeff, yes, it is possible to use another 6-cell pack on your Big Brute, if you can find a place to hold it. If you use two 1200mAh packs and connect them in parallel, your voltage would remain at 7.2, but the current capacity would effectively double to 2400mAh. Your truck should run almost twice as long, but don't be disappointed if it doesn't. As the motor and speed control get hot from longer than normal use, they're much less efficient and use more current than usual. Just as Jim Hall requested, we'll have the Clod Buster and the Double Dare going head-to-head, so stay tuned!

SP

Wrong-way Right

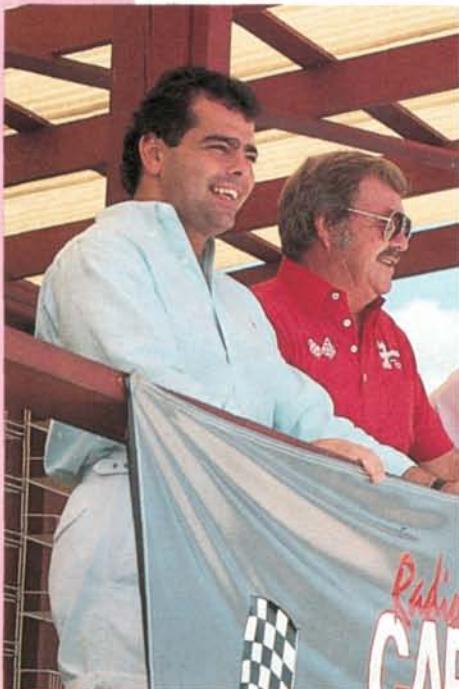
I own the best monster truck of all—the Clod Buster. However, it does have one problem: the steering. In forward, the back wheels turn, in reverse the fronts turn. How can I make all four turn like they're supposed to?

TIM EAGLES
Florida, NY

Tim, no problem at all! The rear wheels are supposed to turn in the opposite direction to the front wheels; if you look at any of the real monster trucks, they steer in the same manner. This method of steering is also used on a skateboard. When you lean to the left, the front wheels will turn to the left, but the rear wheels turn to the right. This action actually allows the monster trucks to turn more tightly than the large wheels would allow with only front-wheel steering. If the front and rear wheels were to turn in the same direction, your truck would only drift left or right and never actually turn. (This is what they call crab steering.) If that's what you want your truck to do, you'd

(Continued on page 14)

PUBLISHER'S PAGE



Publisher Louis DeFrancesco (left) and race promoter Bob Hosch overseeing the race action at Lake Whippoorwill Speedway during the R/C Car Action Weekend last fall.

EDITOR CHRIS CHIANELLI recently approached me exclaiming, "Look how much reader mail has been pouring in!"—the likes of which we've never seen before. When a magazine is the recipient of so many letters, it's usually indicative of something good; in our case, most are seeking advice on a purchase, or are in need of technical information. This leaves us with a great feeling of satisfaction, because it's our objective to inform the modeling enthusiast. The staggering amount of mail we receive tells us we've earned the modeler's trust.

Our "tell-it-like-it-is" product reviews have been the target of controversy by a handful of manufacturers and have resulted in a product embargo by certain manufacturers. They contend that we're trying to undermine them, but this is nothing short of preposterous. If we aren't critical with a product evaluation and make it a "whitewash," then what credibility would we have with the modeling consumer—the end user of the product and this magazine? Critical product evaluations only help the hobby and compel manufacturers to improve their products. Because a manufacturer won't send us a product to review is by no means a deterrent, since we have no problem purchasing the product through normal retail or mail-order channels. This, however, doesn't mean every product we review will have some inherent flaw or weakness, since many of the cars we reviewed have been extremely well-engineered. This policy also holds true for our "Shootouts," as in every competition there will be winners and losers. Our readers want us to put similar types of cars head-to-head to see which one wins, no holds barred! Ask and you will receive!

Some positive inroads are being made on the stock motor issue, and some innovative races are being planned, the first of which, the Sportsman Cup Race, will be held at the Plymouth Hilton in Detroit, MI, March 23-26. No factory team drivers will be allowed, and all racers will receive the same hand-out motors. Drivers will be competing on skill rather than on their wallets. The main sponsor of the race will be Trinity (Car Action will be a co-sponsor). Look for the advertisement in this issue. This race was conceived in the spirit of the R/C sportsman and, hopefully, will help perpetuate this great hobby. I'd like to see many other manufacturers and race promoters follow this lead. ■

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(Continued from page 10)

have to use separate steering servos for the front and rear, as well as a 4-channel radio.

Try this little experiment: Take an empty soda bottle and place it on its side with the top facing away from you. Only by touching the bottom of the bottle, how would you get it to turn left? By pushing the bottom to the right. Get the picture?

SP

Size Me Up

I wanted to modify my Turbo Ultima, so I went to my hobby dealer for advice. They told me to go with a Trinity Pure Gold or a Trinity Silver Dot Modified. I don't want these motors, because these are the only ones they stock. Everybody where I live has a Trinity motor. I wonder if you could help me decide which motor I should get. I want a motor with at least 40,000rpm. Joel Johnson, look out for my Turbo Ultima.

CORY MANN
Mt. Vernon, NY

Cory, this is one of the most frequently asked questions. The rpm a motor will turn has as much to do with the performance of your car as the color of your socks. A number of factors determine which motor would be ideal for your car. If you run on a short track with a lot of turns, you'll want a milder motor, such as a 19- or 20-turn. A track with long straights and fewer turns might call for a 17- or 18-turn motor, such as the Silver Dot or Pure Gold motors you mentioned. The track's surface should also be considered when choosing a motor. If the surface is hard-packed, it won't allow for very good traction, and a hotter motor would only cause the rear tires to break loose under acceleration. So in this case, you may be better off with a 19- or 20-turn. Just keep in mind that more isn't always better. You may find yourself dancing by drivers running the "40,000rpm" motors.

SP

Keep it Up

I've entered a race that's kind of upsetting. In the race, everything has to be out-of-the-box. I have the MRC/

Tamiya Falcon, which comes with the RS-540S motor. How can I make my Falcon and my motor faster, without adding a thing?

ROBERT LEE
E. Palo Alto, CA

Robert, why are you so upset about this type of racing? You should be relieved that you don't have to dump over \$300 into your car to be competitive!

To keep your car performing as well as it should, basic maintenance is the key. A properly maintained car will not only outperform one that has been neglected, but it will also outlast it. Keep all the electronics clean and spray the motor and speed control with a cleaner that won't damage plastic, e.g., Dan's Motor Spray from Dan's R/C Stuff, or one of the others that may be available at your local hobby shop. In the back of your Falcon instruction manual are a number of maintenance tips that you should follow to keep your car in top shape.

SP

Bad Bodies

In your December '88 issue on page 22, you have a '34 Ford Delivery Wagon. Could you please tell me who manufactures this? Please tell me how the Tug-a-war body was mounted and who manufactures it. Would you please do an article in your "Budget Racer" section about the Big Brute?

I enjoy your articles very much and look forward to the magazine's arrival.

DANA TRUSTIN
Mason City, IA

Dana, both the '34 Ford Delivery Wagon and the '41 Willys (Tug-a-War) are made by Parma. I'm sorry I can't give you any info on how the '41 Willys is mounted. However, as it's mounted on a Monster Beetle chassis, switching from a VW Bug body to a '41 Willys shouldn't be a problem if you use universal body mounts such as Parma's.

CC

(Continued on page 188)



The Inside Scoop

by CHRIS CHIANELLI

THE R/C CAR industry is rapidly advancing, with new products being offered at a head-spinning rate. So, I'll make manufacturers nervous, but feed you R/C squirrels who are hungry for info, by bringing you a special report on security leaks and "late-in" items. Here goes!

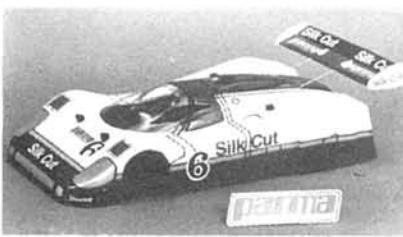


Parma C4 replacement body.

PARMA C4?

Parma's new C4 replacement body, that is! This new body, for what is still

being called the Yokomo C4, includes under-tray, wing with wire and mount. Rumors are that this body has a completely new (some



Parma 1/10-scale Jaguar XJR-8

think hotter) look. According to my sources, Parma (which always responds to trends) is working on a super, scale, 1/10-scale GTP Jag XJR-8 replete with wing.

* * *

EXTRA! EXTRA SHOCKING!
Just in! Andes Hobbies of Laguna Hills, CA, will be

supplying us with high-quality replacement shocks for Tamiya cars. These units

will come brightly anodized (available colors not yet known), and they're fully

TRINITY SPORTSMAN CUP RACE

On March 23, 24, 25 and 26, the first Speedworks Sportsman Cup Race will be held at the Plymouth Hilton in Detroit, MI. This event will be absolutely closed to factory drivers, and all racers will receive the same Speedworks motor, so secret "hot winds" won't be the deciding factors. The industry could certainly use a lot more of this type of event. Uncle Ernie, we salute you!

* * *



TAMIYA TOP SECRET

Unconfirmed reports have come in from our Far East spy, code-name Lingafon. The microfilm was partially damaged in transit, but there seems to be evidence of a "Mini Clod Buster." Moreover, we've heard reports of two new top-of-the-line off-roaders, which have allegedly been spotted at the Tamiya test track. Stay tuned!

* * *

1/4 SCALE GETS A SHOT IN THE ARM!

New Era Models of Nashua, NH, will soon introduce a supermodified. I've taken a very close look at their Pro Stocker, which is featured in this issue, and I've never before seen such fine work on a 1/4-scale produc-



tion car. If Donna and Frank DeSimone of New Era see to it that this quality is carried through their entire line, the future of 1/4 scale will look that much brighter.

* * *

1/10-SCALE FUNNY-AUTO TRANS!

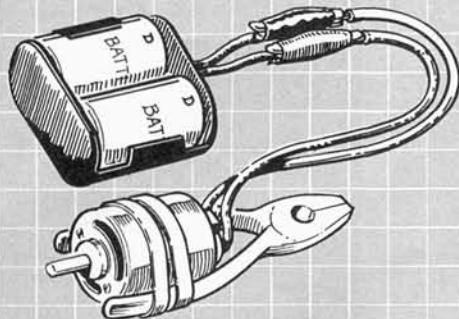
Lazer Lite Racing Systems, which brought us the very competitive Shadow 2+2 1/10-scale road car, has introduced an industry first—a 1/10-scale funny car with a two-speed automatic transmission. It doesn't have a name yet.

Lazer Lite is also tooling up for production of no less than 10 new drag-car bodies, some of which are favorites, but have never before been produced as models, e.g., a '48 Anglia, a '48 Thames and a '33 chopped Willys. With a production schedule like this, it's no wonder Bob

Urban hasn't had time to come up with a name for his funny car. Maybe one of you out there can help with a name?

Pit Tips

by JIM NEWMAN



MOTOR BREAK-IN RIG

Here's a very inexpensive break-in rig: a Radio Shack D-cell battery holder (No. 270-386), two D-size batteries, two insulated battery clips. Total cost: \$3.85. The battery holder comes ready wired, so just solder red and black alligator clips to the wires, "rubber-band" the motor between the handles of a pair of pliers, hook the leads to the motor wires and away you go!

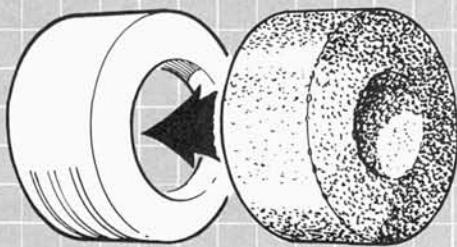
Jeff Godlewsky, Hartford, CT



SWITCH SEAL

Finding that water and dirt were entering through the switch opening and contaminating the contacts, this car owner cut out a piece of thin plastic bag, removed the switch, then sandwiched the plastic between the switch and the body. I've seen a piece of balloon rubber used in this way, too; both work well.

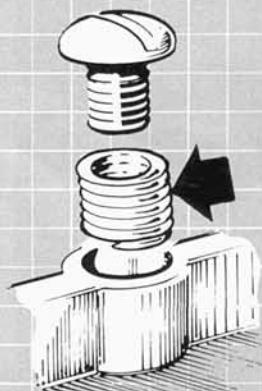
Donovan Bachmeier, Rugby, ND



CURE SIDE-WALL FLEX

If side-wall flex is a problem on your high-profile tires, here's a simple cure. Cut foam rubber or plastic donuts the same size as the tires, then stuff the donuts inside. A band saw cuts the foam very cleanly, but if you can't manage donuts, just cut strips and wind them into a "tire" as you stuff them inside.

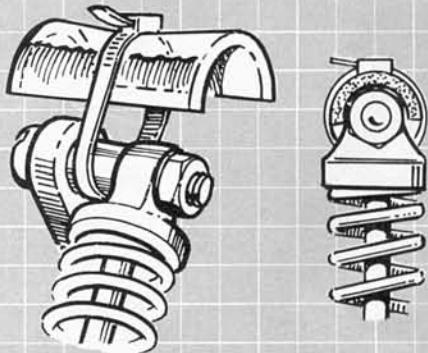
Steve Sattler, Summersville, WV



METAL THREAD INSERTS

This works on the RC10 and the MRP GP-10. Where screws need to be threaded into plastic, dispense with the self-tapping screws and buy steel helicoils at your hardware store. Install them according to the instructions. Now you'll be able to use machine screws, and you'll eliminate the problem of screws stripping out of the plastic, especially where components are regularly disassembled for cleaning.

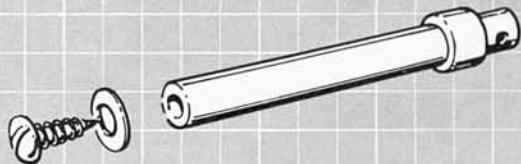
Mark D. Brown, Carrollton, TX



SHOCK-MOUNT PROTECTORS

Most off-road buggies have the shock mounting as the highest point of the car and, as a consequence, when the car rolls over, the tops of the mounts get badly scraped. To prevent this, the owner of this RC10 and Falcon cut pieces of clear $\frac{1}{8}$ -inch-diameter plastic tube and, using very small nylon wire ties (probably from Radio Shack), he secured the pieces of tube to the top of the mounts, as shown. They're practically invisible, but provide a valuable service.

Richard Sanders, Lancaster, OH



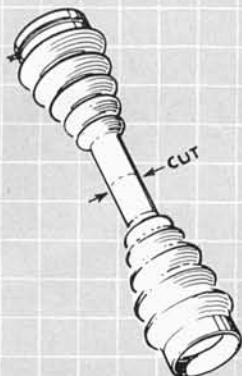
BODY-MOUNT POSTS

Yet another simple idea: At your hobby store, buy pieces of Plast-struct ABS tube that will fit inside one another. Cut collars from the larger-diameter tube, slip them over the smaller tubes at the desired height, then apply a spot of CA. Self-tapping screws up through the frame hold the mounts in place.

Chris Connell, Philadelphia, PA

More Pit Tips on page 24

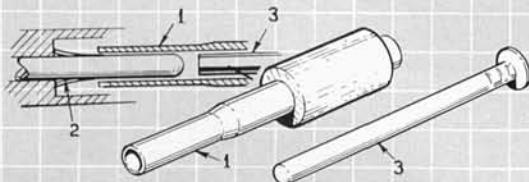
Pit Tips



BETTER THAN BALLOONS

Instead of using balloons over his half-shafts, our contributor obtained the half-shaft boots from a Frog, cut them at the center and slipped the halves over his Kyosho Ultima universal joints. This was quite inexpensive, since one Frog rubber boot yields two covers for his car—and looks more professional!

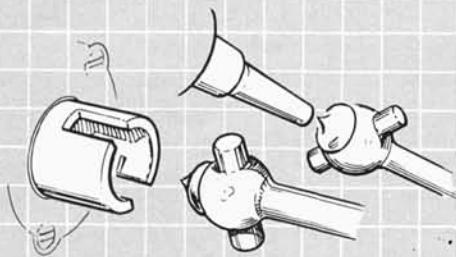
Dan Buchmeier, Cheyenne, WY



PIN REMOVER

The purpose of this little gadget is to compress the barbs of a pin (2), which then allows the pin to be pushed backwards out of the plug body using the pusher (3). The barb compressor (1) is made of $\frac{5}{32}$ -inch brass tube and, for convenience, it's glued into a dowel handle. The end of the tube will have to be slightly reduced in diameter, and this can be done with a file or a strip of emery paper. The pin pusher is a convenient box nail with the point ground flat.

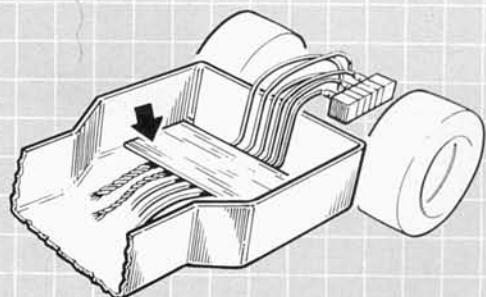
Larry Barnes, Larned, KS



HALF-SHAFT END FLOAT

Instead of using O-rings in the drive-shaft cup to take up any end float, this car owner puts a blob of silicone rubber in the bottom of the cups. He uses Permatex No. 26BR from the auto-parts store, or you can buy a tube of Loctite High Temp RTV gasket maker (No. LHC-07). One tube treats literally hundreds of those "dogbones."

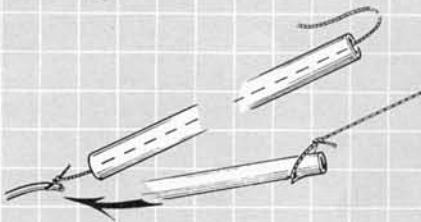
Jim Jerzycke, Harbor City, CA



TIDY WIRING

On most cars with a bathtub chassis, the battery pack is installed under a bird's nest of wires that has to be negotiated when you remove the pack. This car owner has solved the problem by cutting a piece of thin wood, e.g., $\frac{1}{8}$ -inch thick (could be balsa), and jamming it down firmly between the chassis sides with the wires laid neatly underneath as shown in the picture. Now he can remove the battery pack without having to fight his way through all those wires.

Matt Brown, Endicott, NY

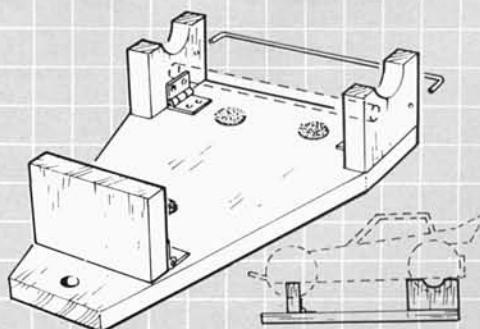


ANTENNA FISHING

On his Tamiya cars, our frustrated owner spent much time trying to thread his antenna wire up inside the plastic, hollow mast. Finally, he sucked a thread up through the tube, tied the wire to it and pulled it though! Note the little barb he cut into the antenna insulation to prevent the thread from sliding off. Another method is to CA fine florist's wire into the end of the antenna wire, then push that up through the mast first.

Troy Turner, Riverton, UT

The wrong drawing was shown in January's Pit Tips. Here's the correct one for Troy's suggestion.



CAR TEST STAND

This handy tool can be made from any useful sizes of $\frac{3}{8}$ - to $\frac{1}{2}$ -inch-thick wood. Notice how the axle stands have been made to hinge down flat for storage, and when folded, they're held in place by those little Velcro dots. When the axle stands are raised, the rear pair is kept spread with a stick or dowel (shown dotted) wedged between them. You could also bend a broad "U" from coat-hanger wire and pop it into holes in the back of the stands.

David Wright, Warner Robbins, GA

Radio Control Car Action will give a free one-year subscription (or one-year renewal if you already subscribe) for each idea used in "Pit Tips." Send rough sketch to Jim Newman, c/o **Radio Control Car Action**, 251 Danbury Rd., Wilton, CT 06897. BE SURE YOUR NAME AND ADDRESS ARE CLEARLY PRINTED ON EACH SKETCH PHOTO, AND NOTE YOU SUBMIT. Because of the number of ideas we receive, we cannot acknowledge each one, nor can we return unused material.



As the racers in the Supermodified Class try to find a faster way into the pits, Kenny Higdon and friend do the ceremonial rain dance from the Owatatjerkyam tribe of the Nevada Sierras.



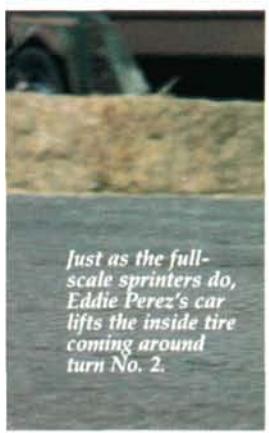
KING EIGHT SUPERNATIONALS

by STEVE POND



Getting a lift trackside is the WCM Grand National car owned by Jason Bromerich.

CONSIDERED TO BE among the premier $\frac{1}{4}$ -scale events of the season, the second annual King 8 Supernationals was again held in Las Vegas, NV. Though sponsored by the King 8 Hotel and Gambling Hall, construction work at the King 8 this year necessitated a change of venue. Race organizer Kenny Higdon chose the Sahara Hotel, where we were allowed to transform one of its park-



Just as the full-scale sprinters do, Eddie Perez's car lifts the inside tire coming around turn No. 2.



During one of the final qualifying heats, Lance Love, driving the Edelbrock/DeLara Sprinter, takes a wild tumble and comes away unscathed.



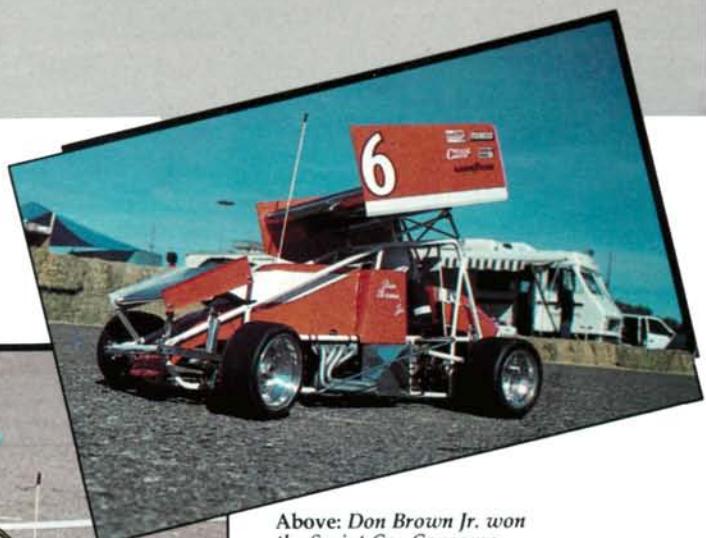
ing lots into a track.

There were three classes of racing: Outlaw Sprint Car, Super Modified, and Grand National. The racers competed for a total purse of \$5,000, which was to be divided evenly between the three classes, with the winners of each A-Main receiving \$1,200 and the rest of the A-Main drivers receiving a percentage of that for their efforts. The events spanned four days, start-

ing with practice on the first day, qualifying on the following two days and, on the fourth day, the final heats.

The first day was relatively uneventful, as racers put in some practice time to get a feel for the track. Racing on a parking lot was a real challenge, as the traction wasn't as good as that of a specially prepared racing surface. In an effort to find the fastest way around the

track, entrants tried a variety of tire and suspension combinations before qualifying. At the close of practice, racers headed back to the hotel to fine-tune their cars and to try to determine what might make the trip around the oval a little shorter for them. Some racers came with motor homes and camper trailers, which made it quite convenient for them to test a new tire or a suspension change.



Above: Don Brown Jr. won the Sprint Car Concours with this beautiful WCM Sprinter that had a functional rear wing.

Left: This sharp-looking WCM Supermodified owned by Ted McKay was able to make it to 5th place in the A-Main.

Although the track was supposed to close at 10 p.m., some drivers just couldn't stop, and they went on testing their cars to see if their work had paid off.

The second day started with the first round of qualifying. Under the rules and race guidelines of

the sanctioning body (QSAC), each competitor would be on the track alone, with four laps to turn in a best time to enter a qualifying heat race. I prefer this format, because each driver gets a fair shot to qualify as high as possible. Too many times in $\frac{1}{10}$ -scale racing I've seen talented drivers who would normally qualify in the A or B Main end up much lower because they were tangled in a crash during qualifying. With this QSAC format, all racers are responsible for where they start in the qualifying heats. And if you have any doubts

Indy In Quarter Scale



These soon-to-be-available $\frac{1}{4}$ -scale Indy cars include (from left to right) the Auto Engineering Indy car, the Lola from B&L Racing, and the March from Raco Modelcraft.

ONE OF THE latest developments in $\frac{1}{4}$ -scale racing is the introduction of Indy cars to the $\frac{1}{4}$ -scale community. Three $\frac{1}{4}$ -scale Indy cars that will soon be released to the public were revealed at the King 8 Supernationals in Las Vegas, NV.

Much like their full-scale cousins,

these new $\frac{1}{4}$ -scale racers have an exceptionally low center of gravity and a low profile that should allow them to exceed the performance of their predecessors, which have their engines mounted upright in high-riding bodies. These cars won't make other types of cars obsolete, but they do present yet another

avenue for enthusiasts to explore. The technology required to keep the hardware tucked under the body will command a higher price tag, but for CART fans, it will be worth it.

Soon-to-be-available kits include the Indy car from Auto Engineering, the Lola from B&L Racing and the Raco Indy car that resembles a March chassis.

The Indy car from Auto Engineering has a shaft drive that's connected to stainless-steel adjustable trailing arms. The trailing arms are supported and damped by a set of oil-filled coil-over shocks. With the 23cc engine, the Auto Engineering car comes in at an approximate weight of 28 pounds.

A prototype that's slated for production by Raco Modelcraft was introduced at the Supernationals and taken for a few successful exhibition laps. This prototype



The No. 17 car driven by Darrel Waltrip is represented here in perfect 1/4-scale a la WCM.



Left: Although Gary DeLara's car wasn't eligible for the Concours contest, it was one of the most beautiful cars on the track.



Lovely Michelle Sharples, Miss King 8, is shown here with the Concours trophy she's about to present to the No. 4 Kodak car owned by Skeeter V.

about the time it takes to run one car at a time for four laps, each of the 120 competitors managed three timed runs.

The fastest lap time in any class was set by Ranch Pit Shop's Gary Kyes, who turned in a time of 6.316 seconds, driving an Alves Outlaw Sprint car with a set of staggered foam tires. Fast lap for the Supermodified Class went to Ralph Burch Jr., who drove his WCM Supermodified to a time of 6.4 seconds—only a hair behind Kyes for the fastest lap.

looked the most complex of the three, with a composite plate chassis that has the same ground effect as that of the full-scale cars. Other features include a 50cc engine (the production version will come with the required 23cc engine to qualify for QSAC racing that's tucked tightly under body with a tuned-exhaust system and independent suspension that's identical aesthetically and functionally to that in the full-scale cars. The current prototype is fitted with a primary and secondary belt-drive system that's scheduled to be replaced on the production version with the high-tech Skellenger Quick-Change rear with independent axles. Although some of the components, e.g., the graphite chassis, will be changed to keep down the cost to consumers, John Rahe has assured me that the car will be very much the same as the version revealed at the

Supernats.

The third car is the B&L Racing Lola Indy car. This car features high-quality aluminum parts throughout, and it also conceals a 23cc engine under a sleek body that covers the fiberglass plate chassis. The suspension is also fully independent and is dampened with oil-filled coil-overs to keep the tires hugging the ground. The drive system uses a primary and secondary toothed pulley that offers a wide range of available ratios.

Regardless of your preference, the 1/4-scale Indy cars have added a new dimension to the budding sport of 1/4-scale racing, and you can count on seeing more of them in the future. ■

In Grand National (the largest class at the King 8), Chris Rahe of Raco Modelcraft drove a Raco Grand National for the fastest time of the class (6.966 seconds) earning him TQ spot of the qualifying heats.

The following day was another day of qualifying, but this time there were five cars in each heat. The heat's lineups were determined by the previous day's lap times. As already mentioned, traction was an important consideration and making a good tire choice was vital. Many types of tires were tested by the drivers, including improved foam compounds, foam-core tires with soft rubber "bands" from Race Craft, and the new pneumatic rubber tires from B&L Racing.

The winner of each heat automatically went to the A-Main, the 2nd-place finisher transferred to the B-Main, and so on. This format gave drivers, who hadn't made such a spectacular solo run, another chance to make it to the A-Main.

In the Grand National Class, Chris Rahe held on to the TQ spot during the 30-lap qualifying heat for his spot in the 150-lap A-Main. In the Supermodified Class, Ralph Burch Jr. was able to hold off Gary Kyes for TQ and the prime starting spot in the 30-lap A-Main. But Kyes bounced back in the Outlaw Class to keep the top spot in the class, which also ran a 30-lap A-Main.

To start the final day's racing, there were a couple of exhibition runs, including that by DWA's 1/4-scale motorcycle driven by Jens Jorgensen. The motorcycle features oil dampened suspension front and rear and a 3.5cc nitro-burning engine that turns about 30,000rpm. Although the track was relatively small for the motorcycle, Jorgensen still put on an impressive

KING EIGHT

SUPERNATIONALS

OUTLAW SPRINT CARS

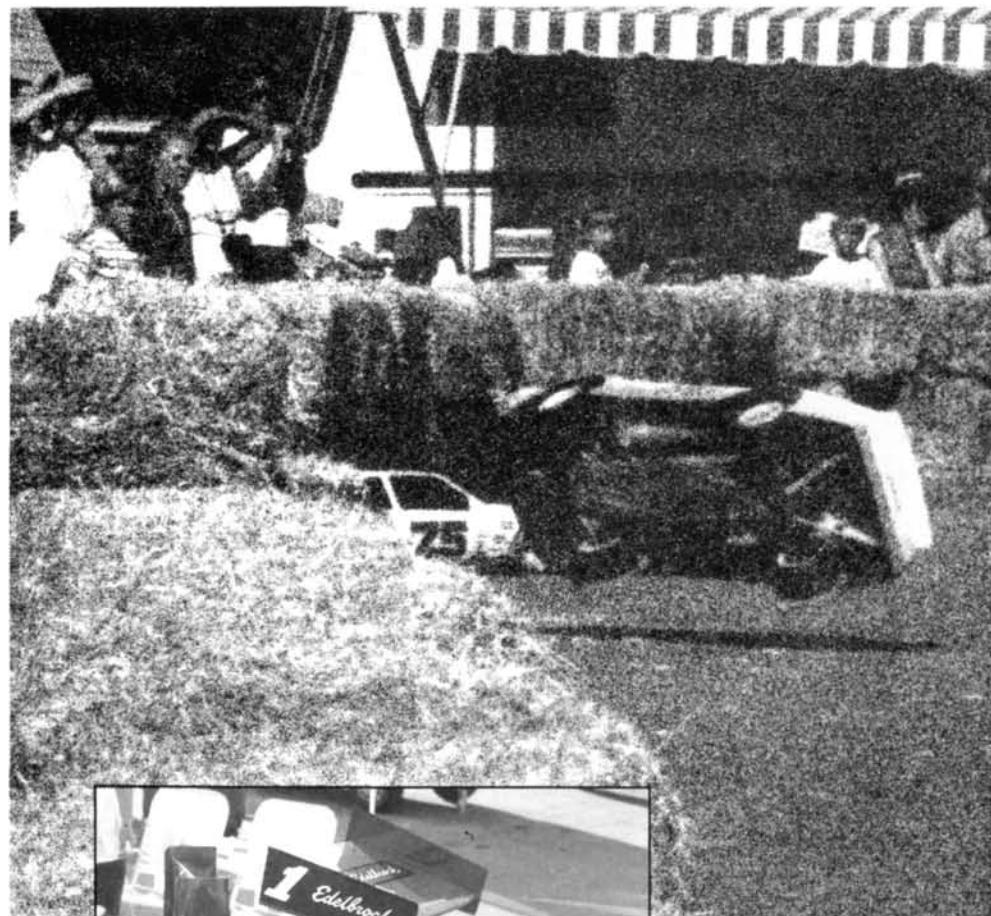
Finish	Name	Car
1	George Brazil	Alves
2	Steve Skellenger	Alves
3	Gary Guffey	WCM
4	Ace Acevedo	WCM
5	Gary Kyes	Alves
6	Lance Love	Edelbrock/ DeLara
7	Neil Schindler	Home Made
8	Ray Luther	Alves

SUPER MODIFIEDS

Finish	Name	Car
1	Ralph Burch Jr.	WCM
2	Chris Rahe	RACO
3	Rock Matthees	WCM
4	Gary Kyes	RACO
5	Ted McKay	RACO
6	Dale Smith	WCM
7	Brian Davy	RACO
8	Fred Brue	RACO

GRAND NATIONALS

Finish	Name	Car
1	Roger Newell	WCM
2	Gary Kyes	RACO
3	Chris Rahe	RACO
4	Fred Brue	WCM
5	Skeeter V	WCM
6	John Rahe	RACO
7	Dave Barrows	WCM
8	Rock Matthees	WCM
9	Jay Halsey	RACO
10	Lorenzo Benton	Auto Engineering



Left: After an exhausting race, the driver of the Edelbrock/DeLara sprint car climbed out and collapsed!

Above: After a tangle with Ralph Burch Jr., Gus Gustafson caught some serious air time on the way to the hay bale.

show as the motorcycle powered down the straights and leaned into the turns exactly like a full-scale cycle.

After Jorgensen's run, John Rahe fired up the prototype Indy car that Raco plans to release in late April '89. The car features a flat-pan chassis with a 23cc engine. The four-wheel independent suspension is similar to that of the full-scale Indy cars, with coil-over shocks that are mounted inboard and actuated by an arm that extends from the A-arm inside the body shell. The prototype featured a toothed belt-drive system, but production versions of the car will use the Skellenger Quick-Change rear with independent axles. While the few laps John Rahe took with the car were relatively tentative, it showed tremendous potential, and its very low center of

gravity enhanced its handling. This will be a car to look for in the near future.

After the exhibition runs, the Concours competition began. All entrants lugged their cars to the center of the



Once the racing was over, Steve Cheek (shown here), Gary Kyes of Ranch Pit Shop, and John Rahe of Raco stripped every engine to ensure that they were stock.



track where they were scrutinized by the judges. One Concours rule states that cars have to be qualified for the race in order to be eligible. Other requirements were a driver and a dashboard, and without them, some sharp-looking cars were out of the running, but this certainly didn't make the final decisions a compromise. I thought the Outlaw sprint car built by Don Brown Jr. was the most impressive entry. His No. 6 Brown's Racing WCM Sprinter had one of the smoothest lacquer jobs I've ever seen on an R/C car, as well as all the other details

that made his car stand out from the rest of the pack. Like the full-scale sprinters, it even had a servo-controlled wing in the rear; its pitch could be changed as the car went into and out of corners.

Because of the larger number of entrants in the Grand National Class, a few of the lower heats had to be run consecutively to bring them even with the Outlaw and Supermodified classes. When they reached a Main of the same level, they began to alternate the classes, starting with the Outlaws, then the Supers and, finally, the Grand Nationals.

To give all the drivers one last chance at making the A-Main, winners of their respective Mains in the Outlaw Class were able to bump up to the next Main, and 2nd- and 3rd-place finishers in the Grand National and Supermodified classes moved up to the next Main, too. In the Outlaw Class, Ralph Burch, driving his WCM Sprinter, qualified for the D-Main and was able to bump up to the C-Main, but that was as far as he got, and he finished 3rd. Lance Love, driving the potent Edelbrock/DeLara

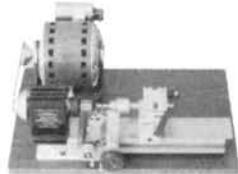


To get a few extra ponies out of his Kodak Grand National, Skeeter V was seen secretly sneaking a flux capacitor under the hood.

(Continued on page 80)

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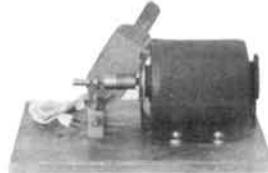


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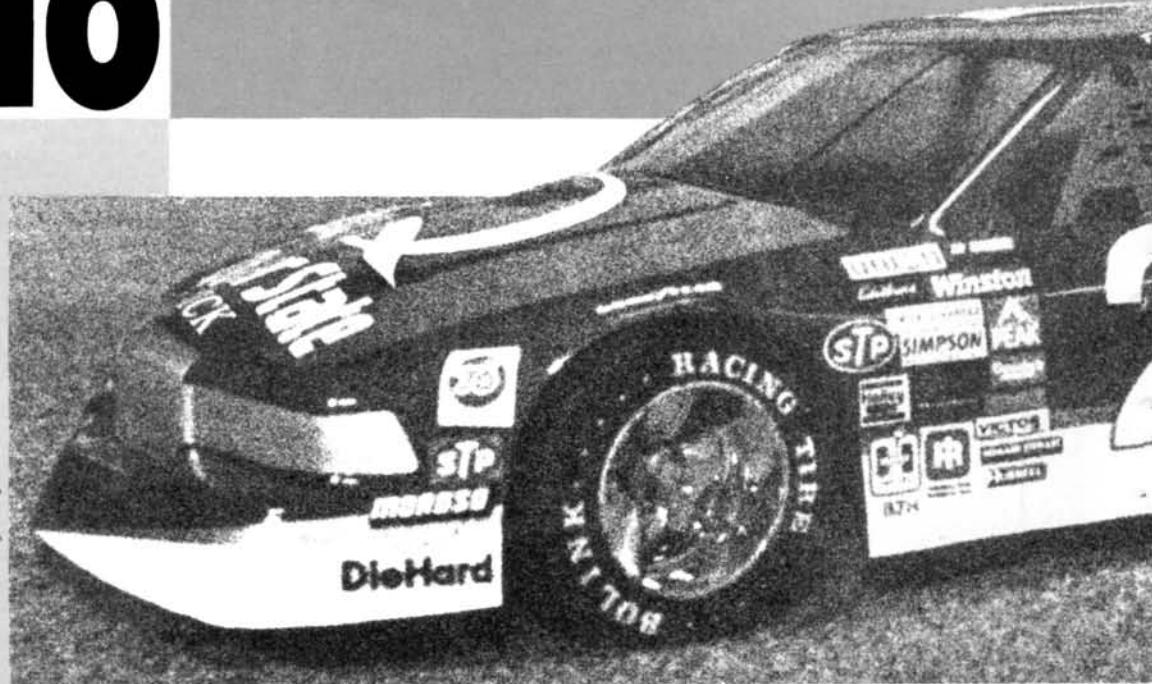
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ON-ROAD RC10

by WALLY DAVID

Photo by Wally David.



AN INEXPENSIVE WAY TO TURN THE RC10 INTO A RADICAL FLAT TRACKER

A replica of Ricky Rudd's Quaker State Buick is used on Wally David's on-road RC10 conversion.

THE ASSOCIATED* RC10 is an on-road car. Yes, it's true. The car that's probably the most widely raced *off-road* car can also be an awesome *on-road* car! In this article, I'll show you how to convert your RC10 into a radical rug-runner. You'll be able to drive away from all those who think they can compete just by putting foam tires on their off-roaders.

The front end is the first area to be modified; here, the most important thing to remember is "the lower, the better." The lower the center of gravity, the easier it will be to get the car around a corner without flipping it. Now, you might think that all you have to do is bring the spring collars up to the top of the shocks and then go racing. *Wrong!* This may get you slightly lower, but the car will be too soft side

to side.

I recommend replacing the front shocks with Parma* Heavy Tie Rod Ends. The Fox Tie Rod Kit (No. 12829) has everything you need for this project. Remove the front shocks, but don't put them away, because you'll use them later. Take four full-length ends and two 1 1/4-inch pieces of threaded rod (you'll have to cut the rods to size) and assemble as follows: Thread a rod end onto the rod as far as it will go, then slide the lower shock pin through the A-arm and rod end as if you were installing a front shock.

I used Andy's* A-arms on my RC10 to make the front end wider and more stable through the corners. Replace the lower shock pin with the Allen screw supplied by Andy's. Next,

install another rod end on the other end of the rod so there's about 1/2 inch of exposed rod between the two ends. Finally, slip the upper rod end onto the stock upper shock mount, and secure it with a locking nut. Now repeat this procedure for the other side.

This modification will allow you to adjust the front ride height to suit the track and the type of tires you're using. There are a few things you should keep in mind. If you make this modification with the Andy's A-arms, you'll have to use TRC* BBS front tires to make the car ROAR-legal. The maximum width allowed is 9 1/8 inches, which you'll just make with these tires. You should also check with your local club or track to make sure they'll allow you to run the car without front shocks. Final adjust-



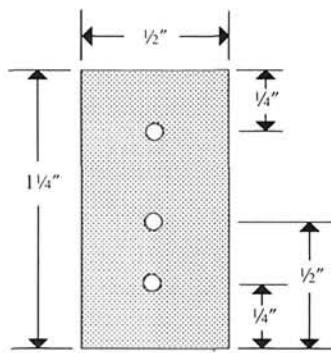
ments will be discussed later.

The next area to attack is the rear suspension. Remove the long shocks and stock shock tower from your RC10; keep the shock-

take the short shocks that you put aside before, and mount them in the outermost hole in the A-arm.

Here comes a tricky part. At this point, you'll need a piece of graphite chassis stiffener made by Associated for the 12L. If you can't find one, a substitute can be made from scrap fiberglass or Kydex. Each piece should measure $1/2 \times 1\frac{1}{4}$ inches. These will be the new rear shock mounts. Using a $1/8$ -inch bit, drill three holes in each mount. (See diagram.)

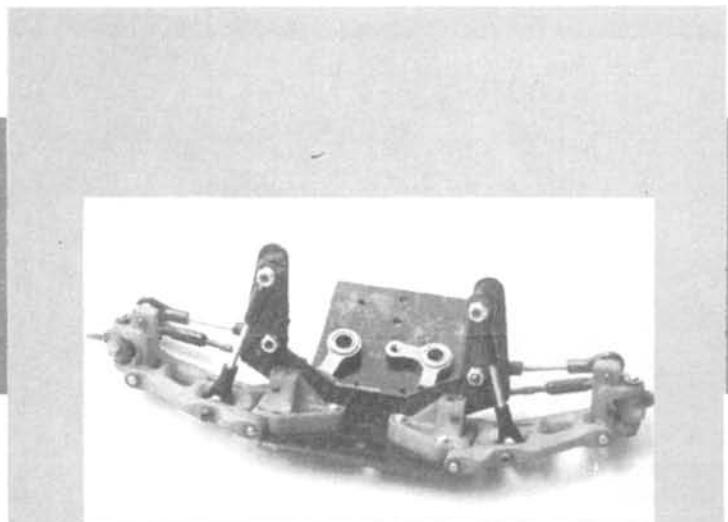
REAR SHOCK MOUNT



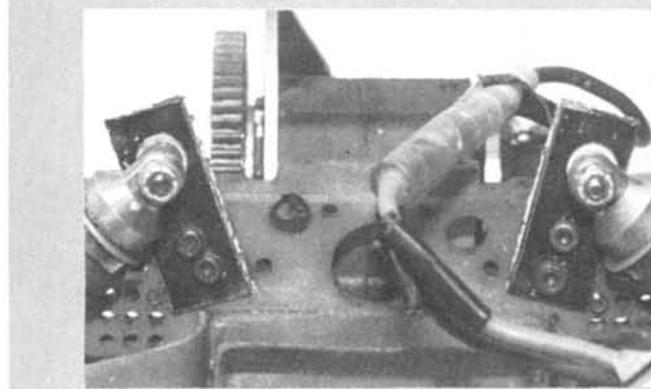
New rear shock mounts can be made from Fiberglass, Kydex or graphite.

mounting hardware for later use, and put the rest away for the winter. Now

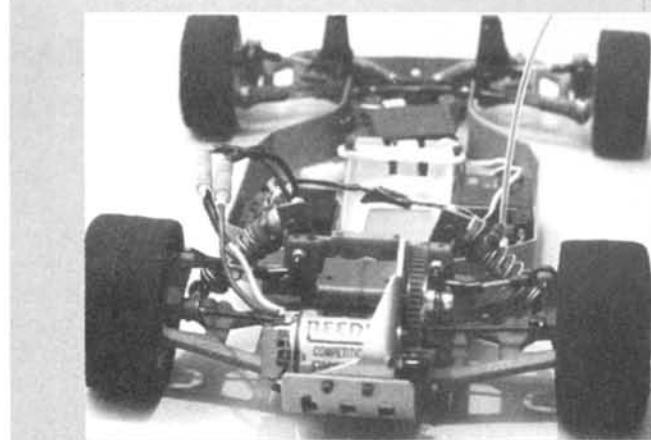
Drill a hole $1/4$ inch from each end, and a third hole
(Continued on page 86)



The front shocks are replaced with Parma's Fox Tie Rod Kit.



Homemade rear shock mounts are used to lower the rear end.



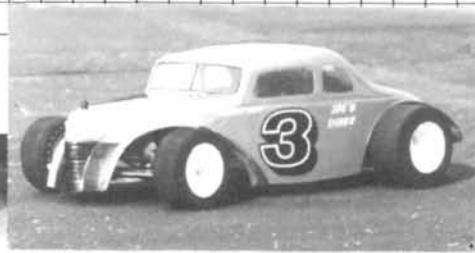
The front shocks are now installed on the rear suspension.

The Pole Position

by RICH HEMSTREET



A major race for Sportsman drivers is planned for Detroit in March '89. Both $1/12$ - and $1/10$ -scale racers will compete.



Clubs have always felt free to dictate body styles; why not do the same with stock motors?

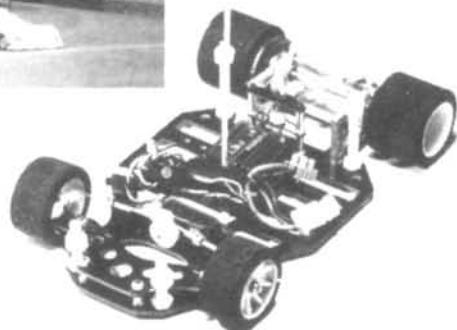
Club racers don't need to worry about the stock motor controversy

THE STOCK VERSUS "stock" controversy rages on. Now that most racers recognize the problem, there's some hope it will be corrected. As Mr. Ernie Provetti has made clear, stock motor racing is out of control, because many manufacturers have discovered ways to build ROAR-legal stock motors that are faster than anyone else's. Once this started, racers found it necessary to run the "hot" stock motor of the month, because somebody else would be "hotter" next month. Advanced timing is built into these stock motors, so enhancing their performance but considerably diminishing durability. Nowadays, to go fast in Stock Class at your local track means buying several motors, even if the series is quite short.

Stock motors haven't been a problem

at most *national* events, because the motors are usually handed to the racers, so everyone runs the same motor. At these national events, racers are usually allowed to buy no more than two or three motors. The best arrangement for this seems to be that the racers must turn in their first hand-out motor when they buy their second one. This way, racers aren't able to buy the maximum number of motors and then dyno test them to find the best one. This method cuts the cost of competition, yet still allows each racer the opportunity to get rid of a motor if it's a real dog.

Club racers shouldn't get trapped in the "hot" stock-motor turnstyle. Your local club should limit its stock racing series to a specific brand of stock or superstock motor. While racers would be free to buy as many of these motors as they wish, this



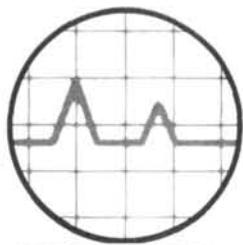
The Eliminator 12 will be one of the cars run for the Sportsman Cup, but not driven by factory drivers.

would still create a situation similar to using hand-out motors at a national event. Only manufacturing tolerances would vary motor performances. It would be best to look for one of the mediocre stock motors or an NARA stock motor to use as your designated club motor. These should last longer than today's "hottest" ROAR stock motor, and this will save money for your club racers.

New Stock Class
Lake Whippoorwill International Speedway has been the site of many major

(Continued on page 112)

SCOPING



BY RUDY MEYER

Kyosho enters the electronic speed controller market!

SCOPING OUT: As we're committed to bringing you the most up-to-date technical information on R/C products, Radio Control Car Action now has Rudy Meyer, an accomplished electrical engineer, to test the newest high-tech electronic equipment that's flooding the R/C market. "Scoping Out" is a two-part test in which a product is first subjected to extensive bench testing using sophisticated equipment and then actually used in the field. These tests will allow us to expose any ridiculous performance claims and, at the same time, provide R/C car enthusiasts with invaluable information on where they should put their money!

IN THE ONGOING QUEST for the "ideal" electronic speed control, manufacturers certainly have their hands full, especially since the consumer wants it to be as small as a postage stamp (and at least as light), solid enough to take a 50G shock, able to handle the hairiest of modified motors, be fully adjustable, and, of course, have a reasonable price (i.e., cheap). Naturally, manufacturers must have certain parameters in mind for each design, and they often design a particular model to perform well under certain limited applications, e.g., drag racing, off-road or on-road racing.

This month's test is of the Kyosho* Super Speed 1000 electronic speed controller. The manufacturer claims high performance and durability are obtained by the use of high-quality MOSFET circuitry designed to fit into a small package. Along with an electronic braking system and a wide-open throttle indicator lamp, Kyosho advertises the following features:



TEST DATA

Model Kyosho Super Speed 1000

DIMENSIONS:

Height	0.5 inches
Width	1.5 inches
Length	1.5 inches
Weight	40 grams
Access to Controls	Fair
Ease of Adjustment	Fair

ELECTRICAL: (Manufacturer Specs)

Max Voltage	9.6V
Max Current	1260 amps
Max Voltage Drop	0.84V at 210 amps
Continuous Current	210 amps

TEST PARAMETERS:

Voltage	6V
Current	12 amps
Voltage Drop	0.15V
Price as Tested	\$239.95

- 210 amps continuous-current capability
- 1260 amps peak-current capability
- 0.004 volt-per-amp voltage drop
- 6 to 9.6 volts input
- weighs approximately 40 grams

On testing this device with my standard Electronic Speed Control Test Unit, I found the following results:

- The Kyosho connector is reversed from the standard configuration; without alteration, it can be used only with Kyosho equipment or with special adapters.
- There is, in fact, a 0.15V drop through the speed control and associated wiring.
- The adjustment control potentiometers rotate in an opposite direction to that which is usual, and they may be difficult to adjust, being off-center from the access holes in the case.
- The response control seems to work in deceleration instead of acceleration, and the braking adjustment lacks sensitivity.
- The 6V to 9.6V operating range limits the usefulness of this unit; its smallness would be perfect for $\frac{1}{12}$ scale, but the BEC won't work on four cells.
- The power switch has no markings to indicate whether it's on or off.

This unit performed well, it ran cool with a 12-amp load, and its overall quality is quite good. This unit is obviously intended to complement Kyosho's product line, and it should operate adequately in any of its products.

If you decide to buy one of these speed controllers, some precautions should be taken, particularly if you'll rewire the unit to make it compatible with your existing equipment. Make absolutely sure that the battery polarity is correct before you hook it up, because if it's reversed, it will instantly fry some of the components inside. Kyosho notes that repairs to this

(Continued on page 116)

B & L RACING

INDY

CAR



by STEVE POND

**YOU SAY YOU'RE AN INDY FAN,
HOLD ON TO YOUR SOCKS!**



SINCE 1911, when cars by the names of Marmon, Lozier and Simplex took the first Labor Day Weekend stroll around the 2.5-mile brick oval track in Indianapolis, IN, the cars of the prestigious Indy 500 have been a strong tradition in American auto racing.

While there's no direct link between the Indy 500 and R/C racing, for many, our enthusiasm for full-scale racing sparked our interest in R/C competitions. Whether you prefer Outlaw sprint cars, Grand National stock cars, dragsters, off-roaders, monster trucks or GTP, R/C racing has had something to offer. However, if you wanted an R/C *Indy* car, you were out of luck—until now! B&L Racing Products* has now answered your call in grand style by introducing its 1/4-scale Indy car.

Starting from the ground up, the B&L Indy car features a fiberglass plate chassis that runs the

length of the car, and it has ABS side sections to complete the ground-effects design that mimics full-scale chassis. The chassis is supported by four-wheel fully independent suspension made entirely of aircraft-grade aluminum. The suspension is identical to that of the full-scale machines: upper and lower A-arms of unequal length that are supported by inboard-mounted coil-over shocks, which are activated by a cantilever system. The suspension is completely adjustable by using threaded aluminum Heim joints at every point where the suspension joins the chassis. On the other side of the Heim joints are heavy-duty aluminum bulkheads to which the A-arms are attached.

The front bulkhead houses the two front shocks as well as the steering assembly, which resembles a rack-and-pinion setup, with a centrally located servo acting as the pinion. The rear-suspension

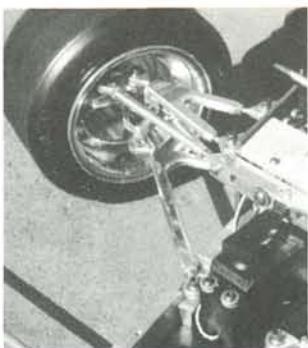
components are also attached to an aluminum bulkhead that looks as though it's made of $\frac{3}{8}$ -inch or $\frac{7}{16}$ -inch aluminum plate. The rear end is also completely adjustable with both toe and camber adjustments.

Between the two bulkheads lies a large belt pulley that drives the rear wheels with a pair of dogbone-type half-shafts. The B&L car isn't yet equipped with a differential assembly, but it might one day be an option.

Powering the Indy car is a Zenoah 23cc air-cooled engine (which is the standard powerplant for a number of other $\frac{1}{4}$ -scale manufacturers) fitted with a tuned pipe for maximum

horsepower. To fit the engine under the low-slung body, it has been installed with the cylinder head facing to the front and the carb pointing upward. The crankshaft exits the engine on the left side of the car and is fitted with a toothed-belt pulley. This is connected to a jackshaft (where the clutch is located) by a toothed belt. Another belt connected to the clutch housing drives the rear end.

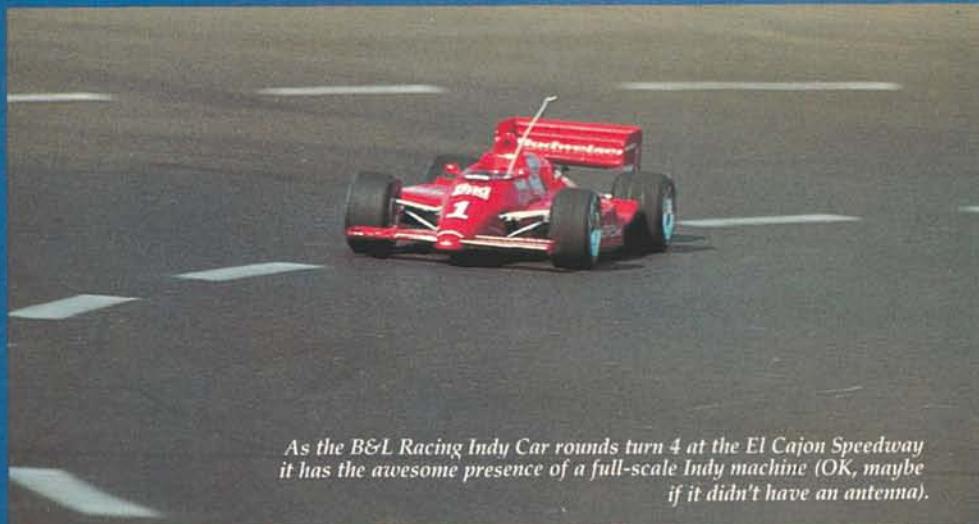
All this adds up to one of the finest $\frac{1}{4}$ -scale cars available. This version of the B&L car is projected to come in with a price in the \$2,000 range, but for this price you'll get all the optional accessories. However, a basic kit with fewer accessories will be offered for a considerably lower price. By the time you read this, B&L should have finished with the produc-



The upper and lower arms on the B&L Indy car are made of aircraft-grade aluminum to soak up the hard shots these open-wheelers take.



Lance Love (left) and Todd Bishop (right) of B&L Racing Products are preparing to remove the body to make some engine adjustments.



As the B&L Racing Indy Car rounds turn 4 at the El Cajon Speedway it has the awesome presence of a full-scale Indy machine (OK, maybe if it didn't have an antenna).

horsepower. To fit the engine under the low-slung body, it has been installed with the cylinder head facing to the front and the carb pointing upward. The crankshaft exits the engine on the left side of the car and is fitted with a toothed-belt pulley. This is connected to a jackshaft (where the clutch is located) by a toothed belt. Another belt connected to the clutch housing drives the rear end.

As well as its mechanical features, the B&L Indy car is aesthetically second to none. The optional aluminum wheels (they're almost exact $\frac{1}{4}$ -scale replicas of the Momo wheels used on the full-scale cars) are fitted with $\frac{1}{4}$ -scale Goodyear rubber pneu-



This sans body view of the B&L Racing Indy Car shows the simple and functional design that should make this car a top performer.

tion prototype, and should be working on complete kits just for us.

*Here's the address of the company featured in this article:

B&L Racing Products, P.O. Box 69, Buena Park, CA 90620. ■

JERON

QUARTER CLASSICS

by BILL SIURU

FOR ONLY \$10,000 YOU CAN OWN THE ULTIMATE R/C CAR.

Ron Phillips (right) and Jerry Mrlik behind limited-production samples of their gorgeous Ferrari-Lancia 801 (red) and Mercedes-Benz W165. In background, 1928 Mercedes.



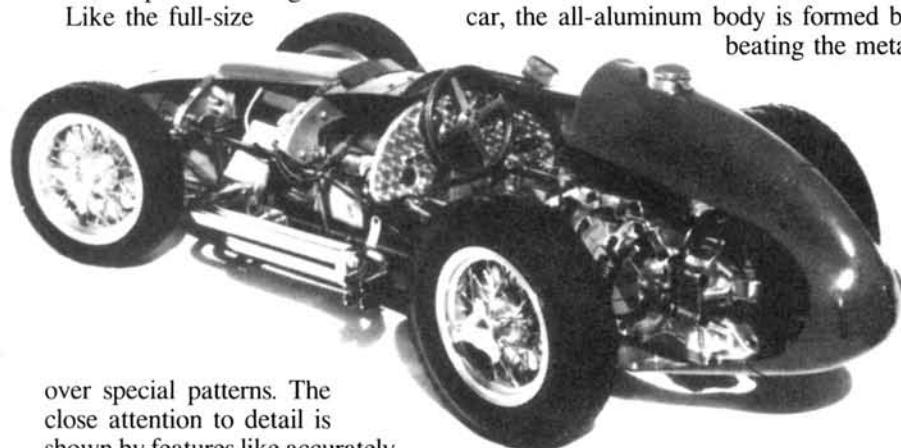
IF YOU HAD AT LEAST \$10,000 to spend on an R/C model car, what could you buy? Well, Jeron Quarter Classics* now offers the ultimate in R/C cars—1/4-scale models of classic racing machines. The company's name combines the names of its founders, former GM engineer Jerry Mrlik (who had a hand in designing the Chaparral race car) and GM attorney and vintage-car racer, Ron Phillips.

Jeron's models replicate two of the greatest machines of all time. First, there's the 1/4-scale version of the Ferrari-Lancia 801 Formula 1 car raced by Peter Collins at Nurburgring in 1957. If this model doesn't interest you, how about the scale version of the equally historic 1939 Mercedes-Benz W165 racer?

Looking at these models, you quickly see why they have such lofty price tags, as the detail and craftsmanship on both Jeron cars is incredible. For example, the model of the famous Ferrari-Lancia racer uses a tubular space frame made of brazed stainless steel, and it has a fully independent suspension system, hydraulic brakes and rack-and-pinion steering.

Like the full-size

car, the all-aluminum body is formed by beating the metal



over special patterns. The close attention to detail is shown by features like accurately scaled louvers, working air scoop, chrome twin-quad exhausts, windshield, and spring-loaded hood straps.

I was especially impressed with the work in the car's wire wheels. The precision-machined aluminum rims and hubs are hand-assembled in special jigs to make absolutely sure they're concentric. Then, specially developed, high-speed, semi-pneumatic tires with simulated valves are added. Just like the full-size car's wheels, they are attached to the hubs with polished three-ear knockoffs that are either right- or left-hand-threaded, depending on which side of the car they're used.

Power comes from a German-built Helmut Bernhardt single-cylinder HB.61 PDP Stamo fan-cooled engine. The 0.61-cubic-inch engine puts out 1.5 horsepower at 15,000 rpm, and the peak torque is 0.60 foot/pounds at 11,000 rpm, while the compression ratio is a whopping 12-to-1. A heavy-duty starter and self-sustaining auto-ignition get the engine going and keep it running, and, like the throttle, steering, and braking are radio-controlled. Power is delivered to the rear wheels by means of a centrifugal clutch, a drive shaft, and a quick-change trans-axle. Final drive is by splined half shafts, each with twin universal joints and pin-drive to each rear wheel. Oversize inboard hydraulic discs are used for braking.

The aluminum, engine-turned instrument panel contains a scaled-down electronic tachometer, as well as gauges showing oil pressure, fuel pressure and water temperature. The handcrafted wood-and-aluminum steering wheels are especially attractive, and even the Monza-style quick-fill fuel cap really works.

A look under the body reveals even more examples of quality work, e.g., parts like the trans-axle case, steering knuckles, shock mounts, etc., are cast in high-strength aluminum, that has been precision-machined and then polished. Other components are made of stainless steel or brass, and all are functional. The fully independent

FERRARI-LANCIA

Type 1957 Formula 1
Scale 1/4
Sug. Retail Price \$10,000

DIMENSIONS:

Overall Length 38.5 inches
Width 14.8 inches
Height 10.5 inches
Wheelbase 22 inches
Front Track 12.4 inches
Rear Track 12.3 inches

WEIGHT:

Gross (w/bat.) 30.8 pounds

BODY:

Type Classic Formula 1
Material Aluminum

CHASSIS:

Type Tubular space frame
Material Stainless steel

DRIVE TRAIN:

Type (prim./sec.) Trans-axle
Differential Quick-change (geared)

Bearings/bushings type 16 ball bearings, 24 bronze bushings

SUSPENSION:

Front: Type Unequal-length wishbones
Dampening Coil-over shocks

Rear: Type Control arms and radius rods
Dampening Coil-over shock

WHEELS:

Type (f/r) Extruded-aluminum w/spokes
Dimensions (DxW) (f/r) 5x1.2 inches

TIRES:

Front JR GP Racing 7x1.250 inches semi-pneu.

Rear JR GP Racing 7x1.375 inches semi-pneu.

ELECTRICS:

Motor HB.61 PDP Stamo
Battery Required Ni-Cd receiver pack (included)

Speed Controller Rotary/Throttle carb

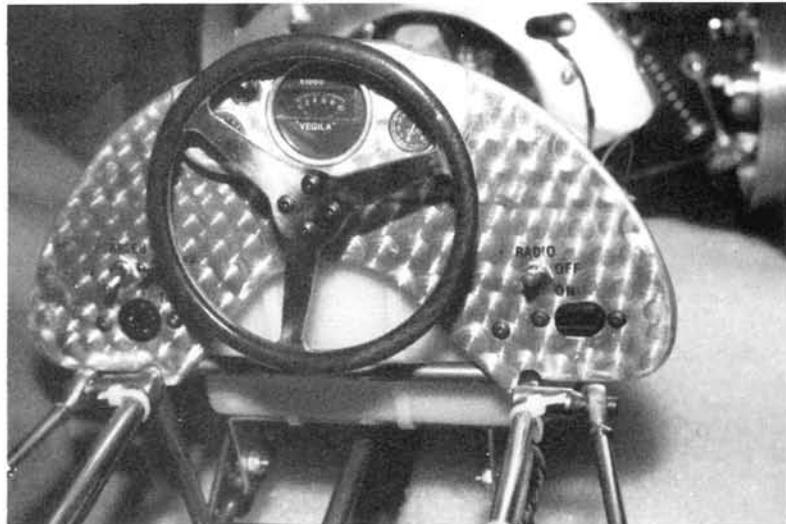
OPTIONS AS TESTED:

Everything is included; the cars are test-run and tuned up at the factory before delivery.

COMMENTS:

All that's missing is a 1/4-scale driver to jump in the car and take off. The car is even warranted for 50,000 meters or 1 year.

QUARTER CLASSICS



Aluminum, engine-turned instrument panel contains electronic tach, fuel, oil and water-temp gauges.

front-and-rear suspension system even has the proper camber and caster angles and spring and stabilizer rates for best performance.

The car is 38.5 inches long, has a wheel base of 22 inches, stands 10.5 inches high, and weighs 30.8 pounds. Naturally, it comes in Ferrari red with all the prerequisite prancing-horse decals.

The Mercedes-Benz model is equally impressive. Both cars come completely assembled from some 1,500 pieces, and both have electronics, Ni-Cd batteries and charger. Each is road-tested, their engines are tuned, and their electronics calibrated to ensure optimum working order. The state-of-the-art R/C components are from Kraft.

The Jeron cars come with a one-year/50,000-meter warranty, and the owner manuals call for gearbox oil changes at 20-hour intervals (the cars use Detron II automatic-transmission fluid).

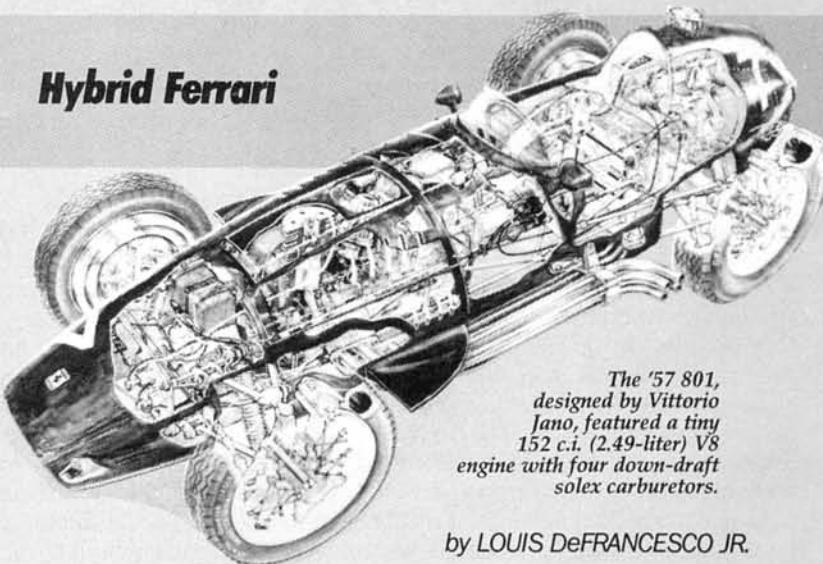


Fully independent front and rear suspensions are cast in high-strength aluminum, as are shock mounts, steering knuckles and trans-axle case. Steering is rack-and-pinion.

and say that air filters should be changed every 5 hours. Only the best precision-ground bearings and bushings, and the finest oil seals and gears are used in these cars.

I doubt that any of these models will ever be seen in parking-lot Grand Prix. Only 50 of each version are planned, and then the body patterns will be destroyed. The limited-production run on these cars

Hybrid Ferrari



The '57 801, designed by Vittorio Jano, featured a tiny 152 c.i. (2.49-liter) V8 engine with four down-draft Solex carburetors.

by LOUIS DeFRANCESCO JR.

LIKE ITS PREDECESSOR the Ferrari D50, the 801 F1 had little success on the Formula 1 circuit in 1957, but to learn more about this Ferrari hybrid, you'll need some insight into the D50.

A joint effort by Ferrari and Lancia resulted in the development of the D50 Formula 1 racer, but its less-than-scintillating performance kept it in the shadows of the more popular cars that bear the prancing-horse insignia.

The Lancia D50 was conceived by designer/engineer Vittorio Jano, and it showed promise early in the '55 season, but Ferrari's dire financial position halted further development and the car was plagued with mechanical problems. Despite its shortcomings, the car was quite an innovation for its



Just like on the full-size cars, wheels are held on with polished knock-offs; two-eared on the Mercedes, three-eared on the Ferrari.



Final drive is by splined half-shafts with twin V-joints. Note inboard hydraulic discs.

should cause them to appreciate in value over time, so get your order in early—as soon as you've saved \$10,000!

Here's the address of the manufacturer featured in this article:

Jeron Quarter Classics, 6730 Halyard, Birmingham, MI 48010. ■

FERRARI-LANCIA 801 F1

time. The D50 chassis was a multi-tubular space frame, and the engine was used as an upper connecting member. Panniers on outriggers held the fuel and were located between the front and rear wheels, with an additional fuel tank in the tail. The 90-degree V8 engine had a displacement of 2488cc, twin camshafts for each bank of cylinders, two valves, two plugs, and twin magnetos. Four Solex 40 P11 carbs fed the fuel, and with a compression ratio of 11.9:1, the power output was 250bhp at 8100rpm. Wherever possible without weakening any part, Jano had drilled holes, and the bodywork was aluminum to keep down the weight.

By the time the '57 season was underway, the car had undergone numerous modifications to its suspension, and the outrigger panniers had been mated with sheet metal to the main bodywork. Its new designation was 801 F1.

However, the life of the 801 was ephemeral, and it was quickly eclipsed by Jano's newest brainchild, the Dino 156, powered by Ferrari's state-of-the-art V6 engine. The Dino was originally designed for Formula 2 racing, but ironically started to outperform the 801s competing in Formula 1!

The Ferrari-Lancias quickly floated into obscurity, and rumor has it that Il Commendatore (Enzo Ferrari) wasn't sorry, as the cars hadn't been designed by his engineering team but only developed by them. After all, a Ferrari is a Ferrari and not a Lancia! ■

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MONSTER MADNESS

SPREADING LIKE WILDFIRE!

by CHRIS CHIANELLI

THE CAR-CRUSHING Corvette pictured here is yet another aberration symptomatic of an advanced case of Monster Truckatosis. You'll know you're afflicted if you exhibit symptoms like sleepwalking to the nearest mud puddle and hav-



ing an inexplicable urge to equip your mother's Honda with 6-foot terra tires!

To quell the fever, next month's *RCCA* will be an emergency Monster Truck Special. Among other features, this relief package will include monster-truck conversions, "Clash of the

Titans," "Return of the Blackfoot," and a track report on the Corvette's cousin, the Double Dare. (Both bear a striking resemblance to their ponderous progenitor, the Big Brute.)

Until then, the Ayatollah of Radio Controlla recommends that you drink plenty of fluids and watch "The Road Warrior" to help you ease the disease. ■



READERS' RIDES

Welcome to "Readers' Rides"! We continually receive photos of readers' latest projects, so we've decided to start featuring some of the more innovative stuff to give all our readers a glimpse of these neat cars and trucks, etc. So here we go! If you want to be part of this new feature, send us a nice color photo of your project with a brief description, and we'll show it to the Ayatollah of Radio Control at the next editorial meeting to see if he'll publish it!

If we publish your photo, we'll give you a one-year subscription to RCCA, or extend your existing one, and you'll even be eligible for our "Readers' Rides Car of the Year Contest" in the fall of '89. Send your photos to Readers' Rides, R/C Car Action Magazine, 251 Danbury Rd., Wilton, CT 06897. Start clickin', shutterbugs!



Mark Rainey's modified Fine Design funny car is a replica of a '57 Chevy gasser that's sponsored by Thundercraft Boats. His car features a Black Magic drag motor, a Novak speed control, a Futaba Magnum Jr. radio and a Paragon Turbo Pac as the "nitrous."



This photo was sent in by Richard Schlosser of Croydon, PA. Richard's stock WCM 1/4-scale Grand National, which he and J.R. Wheeler painted, is a replica of Darrell Waltrip's full-scale ride.

Karen Miller and Bob Young of Miller's Hobby Shop in Akron, OH, sent us these photos of their "his-and-hers" Clod Busters. Both Clods are essentially stock, but many of the chassis parts are chrome plated, and the bodies are painted with Deltron II paint and five coats of clear urethane.

Nice job!

ANODIZING

ADD MORE THAN COLOR TO YOUR ALUMINUM

by JOE BRUNI

THIS IS THE SECOND in my series of articles about the latest in R/C performance and detailing. (For the first article, "To Dye or Not to Dye," see the Jan. '88 issue of RCCA.)

When I opened the box of my Associated RC10 kit, I immediately noticed that the RC10's chassis tub is anodized in gold (not 14K!), and, as I became more and more fascinated with the idea of anodizing, I started to research the topic. Immediately, I realized that examples of anodizing can be found everywhere, e.g., my high-tech home stereo components are anodized black, and many of the parts on your automobile's dashboard are anodized, as are most airplane components, etc.

When a metallic surface is anodized, it's coated electrolytically with a protective oxide. The process involves the conversion of an aluminum surface to aluminum oxide. Simply, the raw aluminum is placed in a vat of acid and, through a series of steps, it's electrified at various voltages, so causing it to have a positive charge (anode) that attracts a layer of negatively

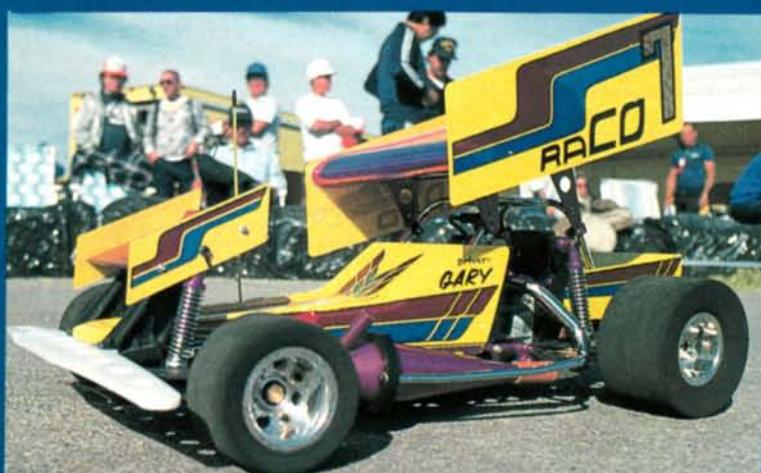
charged particles (oxide) to its surface. There are many good reasons for anodizing aluminum parts, but here are the most important ones for R/C

list, there are many reasons for using it in R/C. If you're interested in anodizing and coloring your aluminum parts, look for an anodizing shop in your local Yellow Pages, and ask about their charges, but beware, because the majority of shops charge a high price for minimum piecework loads. I was lucky enough to find a family-owned anodizing shop called the Professional Anodizing Lab (P.A.L.), down in Houston, TX. Mr. Jack Thigpen, president of P.A.L., charges \$20 (shipping extra) to anodize an

entire car in one color (there are eight to choose from), and this includes aluminum shocks, chassis and screws. P.A.L. also offers re-anodizing for those who aren't satisfied with their factory-applied colors. If you're interested in anodizing your pride and joy, call your local anodizing shop, or give Mr. Thigpen a call, and tell him Joe Bruni sent you.

*Here's the address of the company mentioned in this article:

Professional Anodizing Lab, Inc., 12315 Zavalla, Houston, TX 77085. ■



Custom colors, e.g., this purple, can be added to aluminum wings, shocks, chassis or tuned pipes by anodizing.

modelers:

- It increases corrosion resistance, as it's impervious to water.
- It increases color-dye adhesion.
- It increases surface-abrasion resistance.
- It provides electrical insulation.
- It increases the heat dissipation qualities of the part.
- It facilitates the detection of surface flaws, i.e., cracks.

Initially, I thought that anodizing was done for purely aesthetic purposes, but as you can see from my

RADIO CONTROL CAR ACTION

PRESENTS

RC THUNDERDROME



RC THUNDERDOME

Record-setting run

by STEVE POND

WHAT'S THE LINK between bicycles and radio-control racing? The velodrome! A velodrome is a high-banked oval track used for bicycle racing, but the one in Encino, CA, saw entirely different wheels making their way around its banks—the wheels of the finest R/C racing machines.

The Encino velodrome was the site of the R/C Thunderdrome sponsored by McAllister Racing and Dan's RC Stuff. With a circumference of almost 1,000 feet,



Top: During the Parade of Cars, the competitors lined up their machines for the McAllister Concours contest.



At the front of the lineup are some of the fastest R/C cars in the world. Speeds soared well into the 50s (that's mph!).

at California's Mini Indy

300-foot straightaways, true 33-degree banked turns and an infield almost large enough to accommodate a football field (minus the end zones!), this is the largest track ever to host a major $\frac{1}{10}$ -scale R/C racing event. Experimentation was the name of the game here, as even the top drivers had never before raced on such a massive track, which is so conducive to blistering speeds.

As expected, there was a strong contingent from California, but racers from many states in the Midwest and the East made the trip, too, toting the entire spectrum of racing machines, including three prototype RC10Ls, seven brands of on-road cars and six types of off-road racers converted for on-road racing in the Gear-Case classes.

The classes of racing included Direct-Drive Modified, which



Driving the Team Associated RC10L prototype, Kent Clausen took top honors in the Open Class A-Main as well as the 1-minute Insane Run.



Although it was difficult to see with the naked eye, this stop-action photo shows how most of the faster cars made it around the track—airborne!

ran the open-wheel Indy-type bodies, Direct-Drive Stock (wearing ASA trim), Gear-Case Modifieds (in Wedge or Outlaw bodies), Gear-Case Stock (sporting NASCAR bodies) and a class for the Tamiya Road Wizards. These showed in the obvious Formula 1 trim, although many were dressed a la Indy. Although, for obvious reasons, they couldn't race, the $\frac{1}{4}$ -scale ASA T-Bird from Raco Modelcraft and the new $\frac{1}{4}$ -scale Lola Indy car from B&L Racing also made an appearance.

The schedule of events included practice on Thursday and Friday, qualifying on Saturday and the Mains on Sunday. Before the final races on Sunday, there were many events, including Concours, the Parade of Cars, and the 1-minute Insane Run.

All the racers needed practice, not because their navigation skills weren't up to par, but because the speeds attainable on this track gave them more than they'd bargained for. One of the drivers' main problems was excessive traction in the front end. To make it around the track at average speeds of 45mph, a lot of steering had to be dialed-out of the cars. Methods of accomplishing this ranged from wrapping the foam tires with nylon strapping tape to using unique tires that had been developed specifically for use on this track. These did away with the foam and were actually sections of 2-inch gas hose!

After a day's practice, the drivers were ready for Saturday's qualifying rounds. The Direct-Drive Modified Class saw the Associated RC10L make an

(Continued on page 67)



This No. 6 car proved that the Wizards were all show and all go as this Concours contender tore up the track.

WARP-DRIVE

ONE OF THE wildest Thunderdrome events was the Insane Speed Run, during which the competitors insanely went for *speed at any cost!*

Team Associated's crew definitely looked the most formidable, as drivers Shawn Ireland, Mike Lavacot and Kent Clausen are currently testing prototypes of the soon-to-be-released RC10L—Associated's first $\frac{1}{10}$ -scale on-road car.

The 10L is very similar in design to Associated's 12L, which has been tremendously successful in $\frac{1}{12}$ -scale racing. The 10L's front suspension is of the floating-kingpin variety, and it uses the same suspension blocks as the 12L. Clausen's 10L featured a variation of the 12L suspension block that had additional support in front of the kingpin. The 12L block configuration is fastened to the chassis with a screw that's parallel to the pin and a second screw behind the first one. The blocks used on Clausen's 10L were similar to this, but they have an added support in front of the kingpin, and this allows the use of an additional fastener for increased strength. To prevent radical changes in camber under heavy loads, there was a graphite support spanning the two suspension blocks.

The 10L's rear suspension is again similar to that of the 12L, as it's the same T-plate configuration with a slightly longer "tongue" extending along the center of the chas-



This was the only time we were able to catch Clausen's 10L standing still—waiting patiently for the Insane Run.

sis, and it rides on the same frictionless pivot balls. Tweak adjustment is also the same: It's performed with two screws on either side of the most forward pivot. All other aspects of the rear suspension are the same, with upper and lower plates surrounding the motor and axle. One exception is the added oil-dampened shock that's usually found on the front of the Associated RC10 off-road car. If I've missed a couple of details about the car, excuse me; what's significant is *not* the car's parts, but its performance.

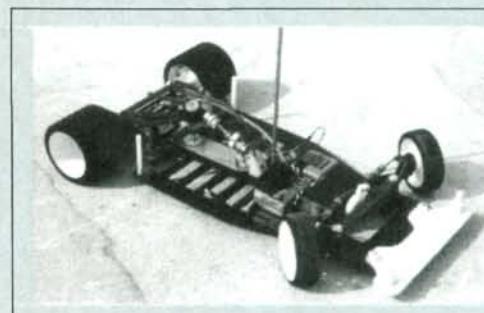
During the Insane Speed Run, Kent Clausen driving his Reedy-powered 10L, set a one-lap speed that has entered the *RCCA* record books as the fastest for a $\frac{1}{10}$ -scale car on a closed course. His 10L was equipped with the same components as those used for regular 4-minute racing, the only differences being its 10-cell SCR pack and Reedy 13-turn motor.

As the last to attempt the

Insane Run, Clausen knew he had to beat Mike Lavacot's 52.8mph average and 54mph fast lap. He went right out with a 53mph first lap and was setting the track on fire as he came around to finish the second lap at 57mph. With the fastest speed already tucked away,

Mike Lavacot.

If the performance turned in by the 10L during the Thunderdrome is any indication of things to come, it will come to $\frac{1}{10}$ -scale racing swinging a big stick, and this won't be the last we see of it! ■



This sans-body view of Mike Lavacot's 10L prototype shows the similarities to its older and smaller cousin, the RC12L.

Clausen continued to shoot for the fastest average of the entire event, when a small irregularity on the back straight catapulted his car into yet another record—the longest recorded *flight* of an R/C car! This mishap cost him so much time that he fell 2mph behind the fast time of



From TMS Racing, Craig Stafford, who won the Gear-Case Stock B-Main, tested the RC10 prototype ground-effects chassis designed for on-road racing; results were promising.

impressive showing in the hands of TQ Shawn Ireland. Also driving the new prototype were Mike Lavacot and Kent Clausen, who turned in times that were tough to beat. In the Direct-Drive Stock Class (the same type of cars as in the Modified Class, but wearing different bodies and stock motors), Mark Lane drove his Twister-powered TRC Pro 10 to the TQ spot. The Gear-Case Modified Class, where most drivers ran the aforementioned converted off-road cars, saw Eddie Knowles turn in the fastest time with his Twister-powered Cox Turbo Scorpion, which used to be one of the hottest off-road cars on the market. In the Gear-Case Stock Class, TQ Tim Ritter drove a Revtech-powered RC10, and in the final class (the Tamiya Road Wizards), Bill Strauss took TQ with Trinity power.

Although Sunday, the final day of racing, started overcast, showing signs of the California winter, a strong breeze moved in later, quickly clearing the clouds and smog to reveal an unobstructed view of the mountains surrounding the beautiful San Fernando Valley. But a view of the mountains was the *last* thing on the minds of the racers as they prepared for the final events of the weekend!

First, the Parade of Cars: Entrants brought their cars trackside and lined



Hobie Kaptan drove this sharp-looking Revtech-powered Wizard to win the A-Main by more than a one-lap margin at the checkered flag.

Finish	Name	Laps	Time	Chassis	Motor	Radio	Body
1	Kent Clausen	19	4:05.39	Associated	Reedy	Futaba	McAllister
2	Joel Gish	19	4:07.59	Vicfor	Trinity	KO	McAllister
3	Shawn Ireland (TQ)	19	4:11.60	Associated	Reedy	Futaba	McAllister
4	Steve Pritchett	19	4:17.15	McAllister	Revtech	Futaba	McAllister
5	Steve Stifel	17	4:00.84	Delta	Checkpoint	KO	McAllister
6	Russ Hawkins	17	4:15.12	Vicfor	Twister	Airtronics	MRP
7	Craig Markle	15	3:32.99	Comp. Craft	Trinity	Futaba	MRP
8	Michael Lavacot	12	2:30.92	Associated	Reedy	Futaba	McAllister
9	Bob Novak	5	1:02.88	BoLINK	Reedy	Airtronics	McAllister
10	Rick Pruitt	1	0:14.21	TRC	Reedy	Futaba	McAllister

DIRECT-DRIVE MODIFIED A-MAIN

Finish	Name	Laps	Time	Chassis	Motor	Radio	Body
1	Bill Martin	15	4:10.67	TRC	Race Prep	Futaba	N/A
2	John Lonero	15	4:16.82	Comp. Craft	Associated	Futaba	McAllister
3	Henry Ricci	14	4:08.26	Comp. Craft	Revolution	Airtronics	McAllister
4	Ted Holt	14	4:10.34	TRC	Race Prep	Airtronics	Andy's
5	Don Franchi	13	4:00.57	BoLINK	Revtech	KO	McAllister
6	Steve Lofvendahl	13	4:04.52	Comp. Craft	Revolution	Airtronics	Premier
7	Roy Peters	13	4:06.77	N/A	Revolution	Airtronics	N/A
8	Ed Felty	13	4:13.42	McAllister	Revolution	Futaba	McAllister
9	Bob Ebel	12	4:07.93	McAllister	Reedy	Futaba	McAllister
10	Mark Lane (TQ)	12	4:11.11	TRC	Twister	Airtronics	Premier

DIRECT-DRIVE STOCK A-MAIN

Finish	Name	Laps	Time	Chassis	Motor	Radio	Body
1	Eddie Knowles (TQ)	16	4:05.89	Cox	Twister	Kraft	JG
2	Paul Pat	16	4:06.22	RC10	Revtech	Kraft	Andy's
3	Greg Lund	16	4:12.10	RC10	Twister	Futaba	N/A
4	Tom Clark	16	4:13.25	AYK	Race Prep	Futaba	Andy's
5	Jon Gironda	15	4:04.68	RC10	Race Prep	KO	Andy's
6	Noel Jordan	15	4:16.93	RC10	Revtech	Airtronics	Andy's
7	Rick Koenig	15	4:17.42	N/A	N/A	N/A	N/A
8	Frank Root	14	4:00.29	RC10	Twister	KO	Andy's
9	Tony Zajicek	13	4:10.12	RC10	Revolution	Airtronics	MRP
10	Ken Moon	1	0:19.71	SMRT	B&R	KO	N/A

GEAR-CASE MODIFIED A-MAIN

Finish	Name	Laps	Time	Chassis	Motor	Radio	Body
1	John Boubel	13	4:04.51	RC10	Twister	Airtronics	McAllister
2	Bob Ellison	13	4:04.90	RC10	Race Prep	Aristo-Craft	BoLINK
3	Tim Ritter (TQ)	13	4:09.13	RC10	Revtech	Airtronics	BoLINK
4	Ron Zajicek	13	4:09.46	RC10	Revtech	Futaba	BoLINK
5	Ron Paul	13	4:13.96	BoLINK	N/A	Kraft	Parma
6	Rick Atwood	2	0:55.74	Cheyenne	Twister	Airtronics	BoLINK

GEAR-CASE STOCK A-MAIN

Finish	Name	Laps	Time	Chassis	Motor	Radio	Body
1	Hobie Kaptan	17	4:06.00	Tamiya	Revtech	Futaba	Wizard
2	Larry Fletcher	16	4:09.68	Tamiya	Twister	Airtronics	Wizard
3	Bill Strauss (TQ)	15	4:11.49	Tamiya	Trinity	Futaba	Wizard
4	Richard Dowdy	15	4:18.31	Tamiya	Trinity	Futaba	Wizard
5	Dan Moynihan	DNF		Tamiya	Revtech	KO	Wizard
6	Bob Sarnelle	DNF		Tamiya	N/A	N/A	Wizard

ROAD WIZARD A-MAIN

INDEX

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RC THUNDERDOME



Driving a Trinity-powered Vicfor machine, Joel Gish made an impressive showing as he came 2nd in the Direct-Drive Open Class.

them up as though for the start of a full-scale event. Although it's highly unlikely that so many R/C cars could get off to a clean start from this type of lineup, it's a great way for spectators to take a close look at these high-performance machines. It was also a chance for the Concours judges (I was one!) to look closely at the Concours entries. After the judging, everyone had a chance to photograph his favorite car, and then those who had entered the 1-minute Insane Run went back to the pits to prepare for it.

While racers readied themselves for



A close look at the tire pictured above will reveal that it's quite a departure from the standard tire used for R/C racing. (It's a piece of rubber hose!)

the Mains, John Rahe of Raco (a 1/4-scale car manufacturer) brought out his new ASA Camaro. John is no stranger to 1/4-scale racing, as he has attended almost every major event. Having never run his 1/4-scale car on a track of this size, he had no idea what to expect. With the tallest possible gears in the Camaro, John tenderfooted his way around the track at about 30mph to get a feel for the surface. With each pass, his throttle finger squeezed a little harder. At the end of the run, John was able to get his car up to 47mph, which I'm sure is almost the fastest one of these giants has run on a closed course.

(Continued on page 128)

BASICS OF GEAR RATIOS

by STAFF

CONFUSED ABOUT GEARING? MAYBE THIS WILL HELP

WHAT GEAR are you running?" This is a question heard frequently at R/C racetracks. Let's take a closer look at gearing.

I'll consider only simple drive trains that include just two gears: the spur gear attached to the rear axle and the pinion gear attached to the motor. To figure out the gear ratio, you divide the number of teeth on the spur gear by the number of teeth on the pinion (i.e., 48-tooth spur : 12-tooth pinion = 4-to-1 gear ratio). The lower the gear ratio, the faster the car will go.

The simplest way to assess the effects of gearing is by looking at a change in only the pinion gear, which is usually the easiest gear to change.

Gearing will affect your top speed, acceleration, and, with electric cars, your running time. Everyone agrees that the larger your pinion, the higher your top speed. Generally, the smaller your pinion, the greater your acceleration will be. There is some debate concerning the effect of gearing as it applies to the acceleration of electric cars. Some say that because an electric motor's torque is highest at 0 rpm, a car with a large pinion will accelerate more quickly than a car with a smaller pinion. Others disagree, but I always seem to get more acceleration from a smaller pinion.

In electric cars, the running time is directly related to gearing. The larger your pinion, the shorter your running time. If you aren't able to make the full time limit, you can switch to a smaller pinion and run longer. Gear for *time*, i.e., use the largest pinion gear you can to finish the

race before your batteries dump.

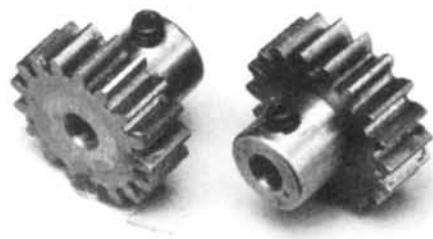
Two aspects of gearing haven't been addressed. First, using your motor efficiently: If you gear for time, but the motor is never able to wind out at its peak rpm, you aren't using the right gear. If you're running a 200-foot-long roadcourse and your car only reaches top speed in the last 10 feet of the main straight, you're over-gearred, and should switch to a smaller pinion. It doesn't matter if you're geared to run for the right length of time; your car's motor should be used to its *full* potential.

Second: gearing as it applies to beginners. If you gear for time, you'll probably go too fast. Can you handle the car at top speed down the straights? How about through the turn at the end of the fastest straight? Do you frequently have to be marshaled there? If you have trouble handling the speed, change your gears. Put on a smaller pinion gear to slow down the car. You'll learn to control the car at this reduced top speed and will become more consistent. You'll also use the throttle more confidently. When you know you can handle the car at top speed, you'll be more likely to blast the car through the low-speed portions of the track.

One common mistake is not being bold enough in making gear changes. In most cases, it's difficult to feel the difference between a 16-tooth pinion and a 15-tooth pinion. If you're just beginning to sort out the gearing that you want, make at least a 2- or 3-tooth change. Drop from a 16-tooth to a 13-tooth pinion. Once you're in the ball-



Whether you're using 32- 48- (shown here) or 64-pitch gears, the same formula is used to determine your gear ratio.



These 17- and 18-tooth, 32-pitch Parma pinion gears are useful when running stock motors on long tracks.

park; you can fine-tune your gear ratio one tooth at a time. ■

This Porsche offered an excellent opportunity to get some close-up detail shots while in the pits.

by MIKE LEE



Photos by Mike Lee.

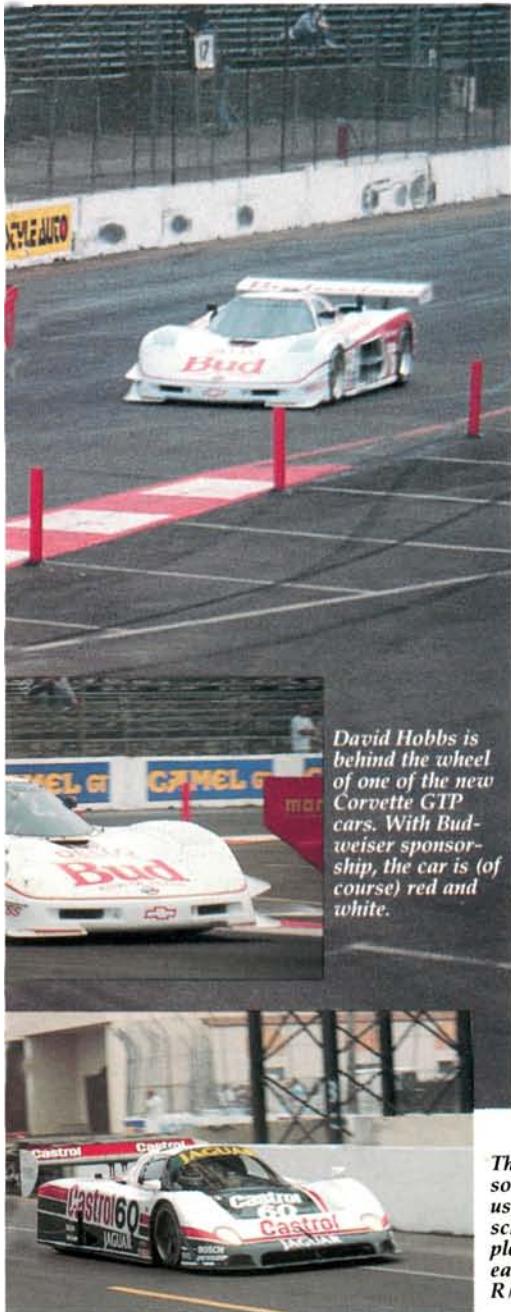
WILD IN THE STREETS

OF ALL THE FORMS of racing, one of the best-known types on the international scene is the Grand Touring Class. This is where many exotic cars make their debuts, e.g., Porsche, Jaguar, Ferrari, Nissan, Chevrolet and Ford. The cars introduced at Grand Touring events offer a look at automobiles that will be available to consumers in the future.

GT cars race on road courses, and many of these are laid out on city streets. The



Below: So you think you have it rough making it through the first turn? Here, five cars go wheel-to-wheel through a turn during a 2-hour race.



The Castrol-sponsored Jaguar XJR-9 uses a superb color scheme that's simple and relatively easy to duplicate in R/C racing.

"track" for the 24 Hours of LeMans is actually a country road in France during the other 51 weeks of the year. The Long Beach Grand Prix's circuit laps around the Long Beach Convention Center, and other track locations, e.g., Daytona, are year-round race centers.

IMSA, the sanctioning body for American GT racing,



Traxxas Fiero

R/C GTP RACING

TIRED OF RACING stock-car bodies? Probably not, if you're anything like the many NASCAR disciples I know. But it's nice to know that at any given time, all those $\frac{1}{10}$ -scale on-road chassis made famous at races like our Car Action Weekend held on the high-banked turns at Lake Whippoorwill International Speedway, can be converted into GTP space-racers just by switching bodies. If you're the proud owner of a McAllister Outlaw, a Parma Panther Pro 10, a Lazer Lite Shadow 2+2, a C&M Cobra, a BoLINK Eliminator 10, or any of the 15 or so $\frac{1}{10}$ -scale on-road chassis, there's no reason why your chassis couldn't have a sleek GTP body bolted onto it. With only minor alterations to the mounting posts, it's easy.



McAllister Jaguar



McAllister Nissan



BoLINK XR4Ti



MRP Corvette

At your next club meeting, suggest a GTP night. There's nothing like a change of pace to instantly breathe new life into club activities. Pictured here are some of the new $\frac{1}{10}$ -scale GTP bodies manufactured by some familiar names. There are many more available, and more on the way.

Keep on racing that stock-car body, but keep an extra GTP body around, in case you get bored; it's like having two cars in one!

separates the GTs into several classes for various levels of racing: GTU, GTO, Lights, and GTP. The GTU class is the most economical; it's limited to production-based cars with engines smaller than 3.0 liters, which means these cars have engines smaller than 200 cubic inches. This class includes the Mazda RX-7, the Chevrolet Beretta, the Dodge Daytona, the Porsche 911 and the Pontiac Fiero. Some are barely recognizable after fender flares, wings, diaplanes and spoilers have been added.

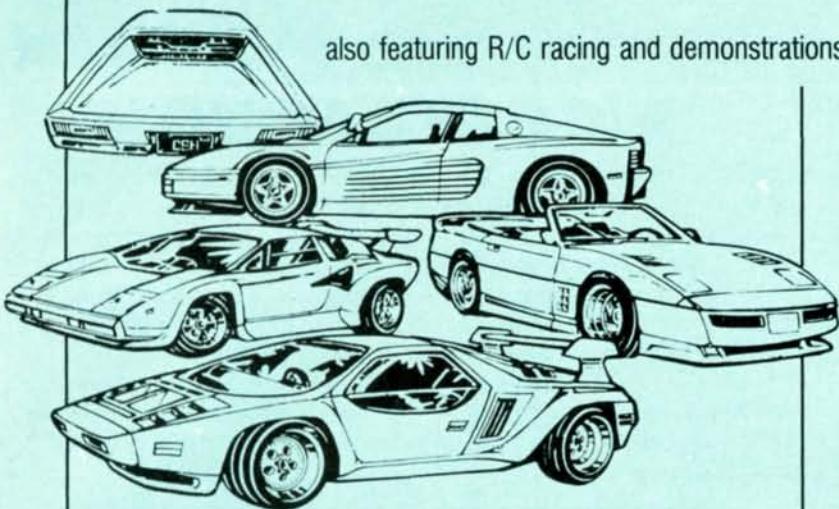
The GTO class is also for production-based cars with engines larger than 3.0 liters *without* turbochargers, or for 2.5-liter engines *with* turbochargers. These cars pick up the pace with plenty of speed and guts. In this class, you'll find the

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Racing will be held on an asphalt roadcourse with seven classes of R/C cars, including direct-drive open and stock, gearbox open and stock, $\frac{1}{2}$ -scale open and stock, plus a Novice Class. Races will be NORRCA sanctioned, and body types will be NASCAR for Stock and Novice and GTP for Open classes. There will be a \$25 per car entry fee and each entrant will receive a free pass to the car show for both days. Call NORRCA for more racing info: (714) 981-9641; 928 North 9th Ave., Upland, CA 91786.

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FULL-SCALE GTP

Merkur XR4Ti, Chevy Corvette and Camaro, the turbocharged Toyota Celica and more Mazdas.

The Lights Class is the "poor man's" version of the GTP Class. These cars are designed strictly as race cars and are limited to non-turbocharged engines smaller than 3.0 liters. At most races, the Lights and the GTPs race at the same time. While the Lights give up a lot of horsepower, they're usually quicker through the tight turns because IMSA permits them to run lighter than cars with larger engines.

"... more than just racing... R&D as well."

The top class is the Grand Touring Prototype (GTP) Class, where many unique and two-of-a-kind cars appear, along with the usual fleet of Porsches. These earth-shattering race cars are powered by engines with more than 750 horsepower, and the designs are of the "anything goes" type. The famous Porsches with the hot, turbocharged 3.0-liter engines go head-to-head against non-turbo 6.0-liter V-12 engines of the Jaguar XJR-9s. It's hard to imagine that two engines so different in size can have equal racing capability, but IMSA closely controls power-to-weight ratios to provide spectators with a good show.

The GTPs, with their superslick bodies and huge wings, are on the cutting edge of automotive aerodynamic designs. They're not only hot race cars on the track, but they're also test beds for the manufacturers to study developments for their production cars. The dependable turbocharger designs were developed on GTP cars for the Ford Turbo Thunderbird; even the high-temperature brake linings used in almost every new car resulted from tests on these race cars. Grand Touring is more than just racing; it's research and development as well.

I had my chance to spy on these hybrid Grand Touring cars at the last race of the IMSA Grand Prix season—the Del Mar Grand Prix of Southern California. This race features a track made on the large parking lot of the Del Mar horseracing track in San Diego, CA. The course is 1.62 miles long and the longest straight portion is 2000 feet—just slightly under

(Continued on page 146)

by FRED MURPHY

DRAG RACING is still in the early stages of its development, but, already, we have racing in $\frac{1}{12}$ and $\frac{1}{10}$ scale—even $\frac{1}{4}$ scale! That's right!—models that are one quarter of the size of the full-scale drag cars and with as much scale realism as any form of R/C racing.

Quarter-scale racing has been around for the past few years and is continually growing in popularity. If your love is Grand National, sprint cars, Super Modified, Indy cars or drag cars, you can indulge yourself with R/C, as an increasing number of companies present products that have as much engineering research and development behind them as the full-size cars. Notable among the innovators in $\frac{1}{4}$ -scale design is New Era Models, Inc.* with its line of true-to-scale cars that includes the Pro Stock



NEW ERA PRO STOCK

Drag car.

The Pro Stock Drag car is a scale 25-inch-wheelbase chassis that's currently available with an '88 Camaro, Thunderbird, Monte Carlo, or Corvette body. The New Era car kit comes to you with every nut, bolt, and washer you'll need to have the *hottest*

thing ever on four wheels.

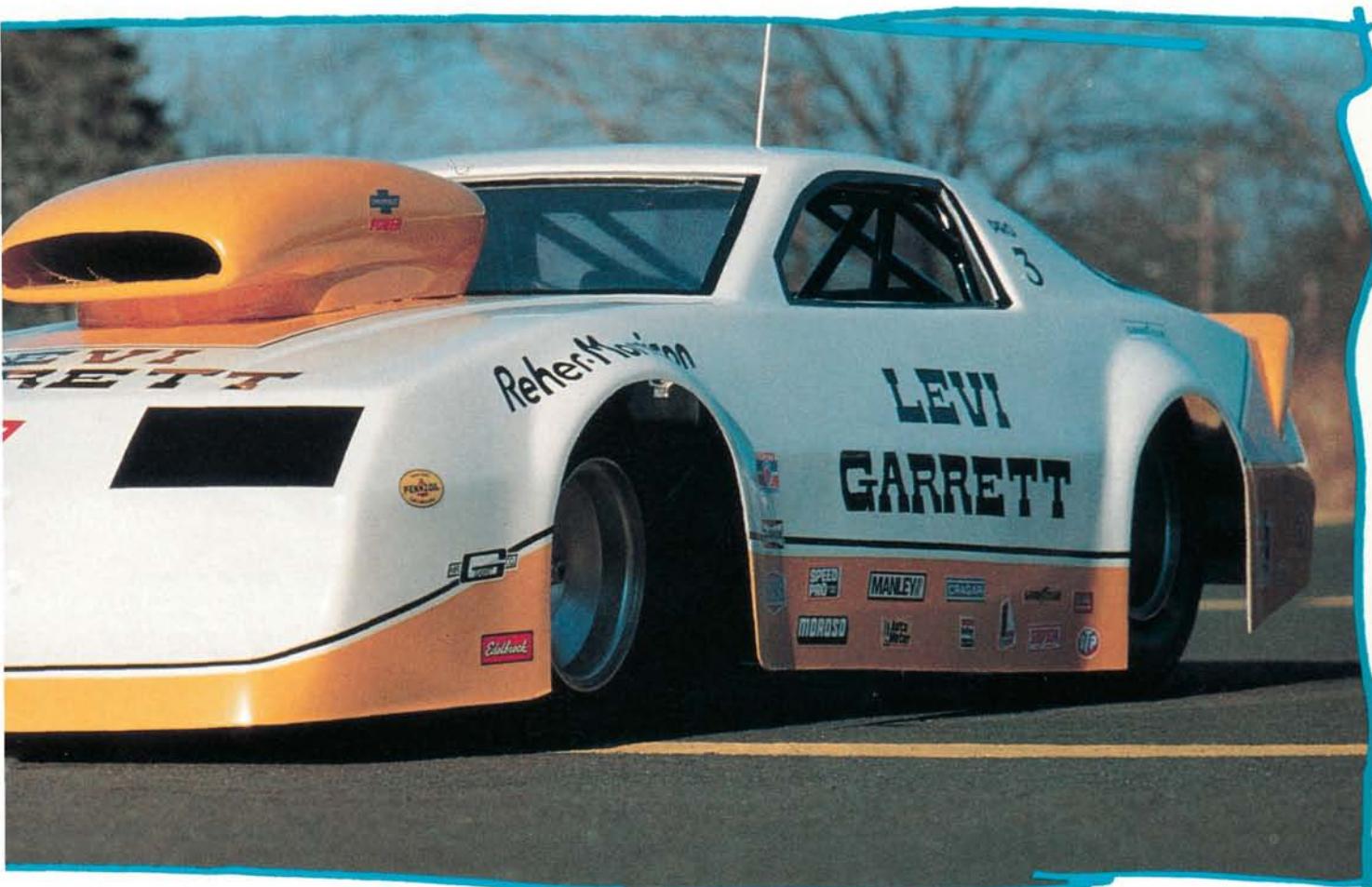
On opening the kit's shipping container, you'll find a welded 4130 tubular-steel frame with a built-in roll cage that has been painted in high-gloss black (but I'm sure it can be custom-painted in your choice of color). The kit also includes the radio tray, under-chassis pan, precision ball bearings throughout, a complete complement of stainless-steel hardware, coil-over oil-dampened shocks, fully adjustable front end, a true five-link rear suspension with dual, inboard, disc brakes and deep-dish aluminum wheels with a 1 1/2-inch front tire and a set of 4 1/2-inch-wide rear drag tires.

The standard powerplant supplied with the kit is a 35cc 2.3hp Quadra gas engine that runs on a 20:1 gas/oil mix, but, if you like, you can use an optional 50cc or 75cc *monster* powerplant. Some other options available for the Pro Stock car include an interior kit with dashboard; rear-wheel tubs; a

(Continued on page 79)



SHAKE, RATTLE 'n' ROLL!



WITH THREE YEARS of Pro-Stock racing now behind him, Bruce Allen, driving the Reher-Morrison Chevrolet, is hovering at the top of the NHRA Pro-Stock charts with a title in sight. Running a Camaro in '86 and '87 and a Beretta in '88, the Reher-Morrison/Levi Garrett Racing Team has consistently been among the top four in NHRA competition. Their powerful, thundering Chevrolets sport 500c.i. engines that produce more than 1,100 horsepower. With championship drivers like Bruce Allen behind the wheel, these awesome 1/4-mile performers are capable of covering the distance in 7.3 seconds at over 190mph.

Thanks to the Pro Stock Owners Association and Reher-Morrison/Levi Garrett Racing for this information.

NEW ERA MODELS

PRO STOCK CAMARO

Type Pro Stock Drag Car
Scale $\frac{1}{4}$
Sug. Retail Price \$1,295

DIMENSIONS:

Overall Length 47 $\frac{1}{2}$ inches
Width 18 inches
Height 11 $\frac{1}{2}$ inches
Wheelbase 25 inches
Front Track 16 inches
Rear Track 15 $\frac{1}{2}$ inches

WEIGHT:

Gross (w/bat.) 32 pounds

BODY:

Type 1988 Camaro w/Pro Stock hood scoop
Material Fiberglass

CHASSIS:

Type Tubular w/built-in roll-cage
Material 4130 tubular steel

DRIVE TRAIN:

Type (prim./sec.) Chain/belt
Differential Centrifugal clutch

SUSPENSION:

Front: Type A-arm
Dampening Coil-over, oil-filled shocks

Rear: Type Radius arm w/pan-hard bar
Dampening Coil-over, oil-filled shocks

WHEELS:

Front: Type Two-piece aluminum
Dimensions (DxW) 4x4 inches

Rear: Type Two-piece aluminum
Dimensions (DxW) 4x1 $\frac{1}{2}$ inches

TIRES:

Front Foam
Rear Foam-core w/power rubber shell

POWER:

Motor 35cc, 2.3hp Quadra
Fuel Required 20:1 gas/oil mix

BRAKE SYSTEM:

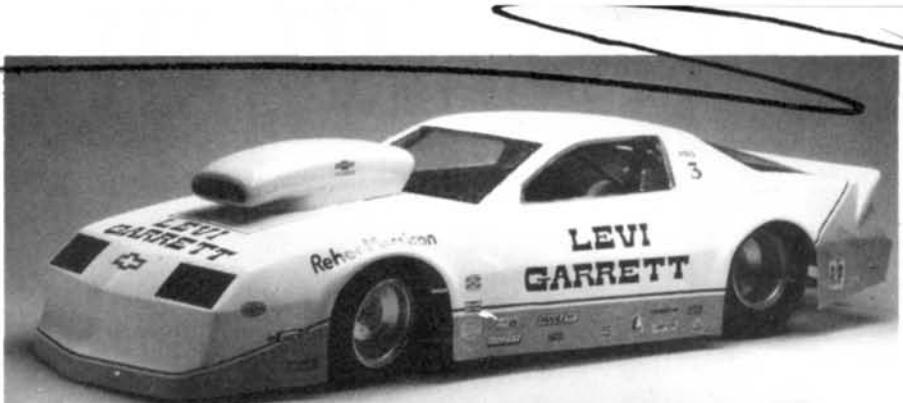
Inboard, dual disc

OPTIONS AS TESTED:

Headers; wheelie bars; Futaba Magnum radio with two SP 134 servos; Deans antenna.

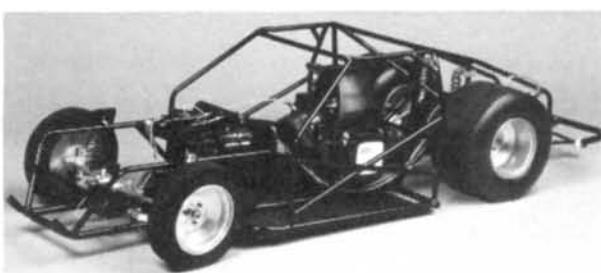
COMMENTS:

Workmanship of components and finish on all welds is excellent. Some minor deburring is necessary, but assembly is easy with well-labeled parts bags that "walk" you through assembly steps. Fiberglass bodywork is outstanding, providing great scale detail. Quadra engine starts on first pull and shows quick throttle response. Braking system is fully adjustable, but tended to be a little sensitive until fully broken-in.



Right: Full view of the Pro Stock chassis shows easy access to all components with a superior 4130 tubular cage providing the protection.

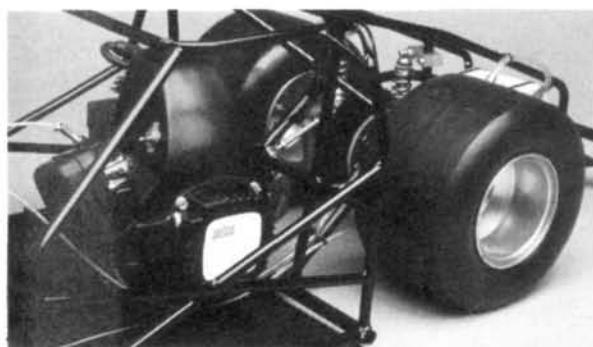
Above: A sleek IROC Camaro body with a Pro Stock hood scoop poses ready to pound the pavement. All Levi Garrett graphics are hand-cut using Cover-ite Presto Film.



set of headers; wheelie bars; a parachute; and soon-to-be available inflatable racing slicks. The comprehensive accessories even include a set of scale side-view mirrors for those looking to create a scale street machine.

You just have to supply a 2-channel radio, assembly time and gas/oil mix and you're racing! The manufacturer has done all the hard work, giving you finely machined components that are tapped and drilled for a smooth fit. The assembly manual is easy to follow, as it has good illustrations and photos that will guide experienced modelers through to a finished race car. While on the subject of experience, remember that $\frac{1}{4}$ -scale cars aren't toys; they're far from it, both in operation and in cost, but don't let them intimidate you. Their relationship to the full-scale cars is closer than many think, and they can be a very rewarding building experience for anyone.

The front suspension on the New Era Pro Stocker is an A-arm system with independent coil-over shocks on each side. The steering arms are made of tubular aluminum with a stainless-steel ball link on the ends for strength. The rear suspension is a solid axle with front and rear radius rods and a pan-hard bar that forms the New Era cars' five-link rear axle. This is the *ultimate* in rear-axle adjustability. (Continued on page 150)



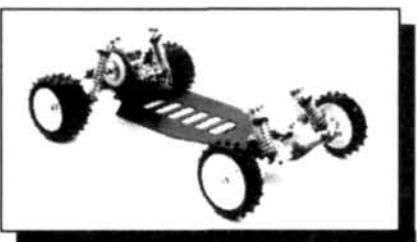
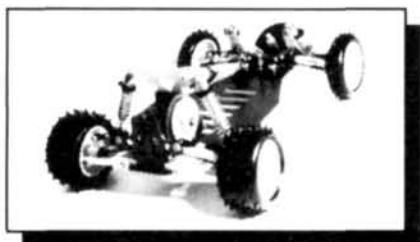
Steering and front suspension on the Pro Stock are well-designed and fully adjustable. Optional shock-mount holes allow quick changes in ride height, and tie rods with stainless-steel Heim ends make toe adjustments easy.

With power provided by a Quadra 35cc engine, the big 4 $\frac{1}{2}$ -inch-wide drag slicks are waiting to heat up. Once again, rear end is fully adjustable because of the five-link suspension topped off by a set of coil-over shocks.

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KING 8

(Continued from page 31)

Sprint Car, was able to move into the B-Main from the fourth qualifying heat with a 2nd-place finish. A 1st in the B-Main bumped him to the A, but after having a few problems, he could only muster a 6th for the feature. A battle for the top Sprint Car honors developed in the A-Main as Gary Kyes, the top qualifier, ran with the lead for most of 15 laps and then had some engine troubles. These were thought to have been caused by too much nitro in the fuel, and he dropped back to 5th position. George Brazil, who was second to Kyes, took the lead with his Alves sprint car, and he didn't look back as he took it from there all the way to the checkered flag. Steve Skellenger, driving his Alves sprinter with his Quick-Change rear, finished second.

In the Supermodified Class, Ralph Burch Jr. really strutted his stuff with his WCM Supermodified. As the top qualifier, Burch was the favorite to win, but he wasn't up against a bunch of slouches. Right from the start, Burch jumped to the lead, but Chris Rahe was close behind with his Raco Supermod. Burch poured on throttle and powered away from Rahe for the payoff. Rahe held on to 2nd just ahead of Rock Mathees, who was able to bump up from the E-Main for 3rd place in the A-Main with his Raco Supermodified.

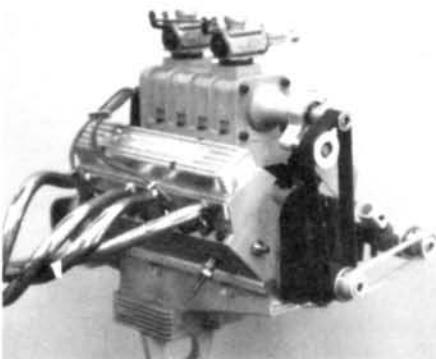
Honorable Mention has to go to Jens Jorgensen, racing for the DWA team with a DWA Supermodified. This was the first race in the U.S. for Jorgensen and for his DWA car that's accustomed to the 30cc engines used for 1/4-scale racing in Europe. It was also his first cruise of the oval, and this was probably a shocking change of pace from the "road-course-only" racing of Europe. Fitted with a 23cc engine for States-side racing, Jorgensen came from the last qualifying heat to the C-Main, where he placed 1st and moved up to the B-Main. His hunt for the gold was cut short with a 4th-place finish, but we must commend him for a job well done.

It was only appropriate that the last, and longest, race of the event—the Grand National 150-lap A-Main—was the closest-run Main. From the starting gun, the 1st-, 2nd- and 3rd-place qualifiers, Chris Rahe, Roger Newell and Kyes drove as if they were connected at the crankshaft. Rahe and Kyes both ran Raco Grand Nationals, and Newell kept pace with his WCM Thunderbird Grand National. To say that one of the three

(Continued on page 86)

Conley V-8—Smallest V-8 Production Engine

The Conley "362" is the world's smallest production model V-8, and is now available in a rough casting kit. With the use of a Bridgeport Milling Machine and a lathe you will be able to machine the kit-provided material into a working V-8. Items included in the kit: castings (block, valve covers, pan heads, and intake), piston rings, water pump, timing belts and pulleys, camshaft lobes, injection-molded parts, wristpins, crank pins, 95% of the required metal, valve springs, screws, taper pins, dowel pins, Loctite, O-rings, and blueprints. The engine has a bore of .750 and a stroke of .625 which gives a total displacement of 36.2 cc or 2.2 ci and weighs approximately 5 lbs. It measures approximately 6" long, 4" wide, and 7 1/8" to the top of the carbs (when optional supercharger housing is used). There is an operating rpm from 2,000 to 12,000. Perfect for 1/4-scale cars and boats.



Total price, including shipping and insurance	\$459.00
Optional items:	
Supercharger Intake Manifold (nonfunctioning), including pulleys and belt	\$49.95
Ball Bearings (11 required)	\$108.00
Blueprints (Will be credited toward engine purchase; engine cannot be made from blueprints alone.)	\$40.00
Illinois residents add 6 1/4% sales tax. Make checks (money order, cashier's or certified checks) payable to:	

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Avante w/motor	288.00
Traxxas Cat	119.00
Traxxas Fiero	119.00
Traxxas Bullet	119.00
Astro 104 Charger	29.00
Astro Turbo Motor	47.00

Prices above are for members only!

KING 8

(Continued from page 80)

dominated the race would be an injustice, but when push came to shove, there could only be *one* winner, and each drove as if his life depended on crossing the line first.

With 150 laps of racing, the drivers had to depend on a lot more than just their driving skills, as, to make the distance, each car had to make at least two pit stops for fuel. While each was hoping for an exceptional pit to extend their lead, all the top three crews were able to get the cars refueled in a heartbeat and this extended the bumper-to-bumper action for the length of the race. Though Kyes, Rahe and Newell swapped the lead countless times, the race began to close in on the final laps. Then, with only five laps to go, Newell ducked inside for the lead and set his sights on victory. Kyes made one last charge at Newell, but he wasn't able to put together a sufficiently fast lap to catch him. Newell crossed the line for 1st place, but, after 150 laps, both Kyes and Rahe were still closer than a lap.

The rules set up by QSAC have to be credited for the caliber of racing during the weekend. The rules are set in such a way that all competitors start on an equal footing and excel because of superior driving and chassis-tuning skills, not because they had more money to spend on their car. Although the rules may not be perfect, the governing members are doing their best to keep the racing affordable and competitive. The balance of the credit goes to the race organizers, including Ken Higdon, John Rahe and Steve Cheek, who orchestrated this smoothly run event.

If the excitement of these big-bore quarter-pounders has your attention, fear not; you won't have to spend half your savings to be competitive. All you need are skill and fuel!

ON-ROAD RC10

(Continued from page 35)

½ inch from one end; this will be the bottom of the shock mount. Next, drill two holes in the rear bulkhead, one in each side. Position these holes ½ inch above and ¼ inch to the inside of the upper, innermost hole on the bulkhead. Put a ¾-inch Allen screw through the middle hole on the shock mount and screw it into the new hole in the bulkhead. Install a locking nut on the end of the screw as it comes through the bulkhead, but don't tighten it yet.

(Continued on page 100)

BoLINK ENDURO 10

QUICK PIT STOPS WITH A PRODUCTION CAR!



by MIKE LEE

Track Report

IN THE HEAT of a race, the drivers and cars may not be the decisive factors. In many cases, a race is too long for cars to make it without refueling and a change of tires, and soon it's time for a *pit stop!* That's where the quality of the pit crew can make or break the winner. The crew has to be fast and efficient, making pit stops as exciting as the race itself.

Until now, there have been only a few endurance-type races in this country. The trend started with gas cars running

30-minute and longer main events, but endurance races for electric cars only caught on a couple of years ago. Admittedly, virtually none of the electric cars was equipped for quick battery changes, but when endurance races for electrics began, some hybrid cars were designed. Now, BoLINK* has introduced the first production $\frac{1}{10}$ -scale on-road endurance racer—the Eliminator Enduro 10.

The Enduro 10 has some of the design features of the previously reviewed standard Eliminator 10, which is a very fine, competitive, $\frac{1}{10}$ -scale road car. BoLINK carries on its tradition of fine handling and durability in the Enduro, and has added the capability to make quick pit stops for "refueling." Both cars have the same front end, consisting of a fiberglass cross beam mounted on silicone-dampened ride adjusters. Small coil springs provide the suspension at the wheels, while the dampened ride adjusters provide camber and caster adjustment.

At the rear, a suspended T-bar rear pod carries the



BoLINK's new Enduro 10 is designed for the new long-distance electric races.

**NOW YOU CAN GET
THE ONLY R/C CARS
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SOUND BARRIER.



The Mercury XI-4 is a 1/10 scale radio control car has many features which give it a distinct advantage in competition racing: 2 belt / 3 differential system, oil-filled adjustable shocks, low-profile pin spike tires, linear speed control, aerodynamic polycarbonate body, monocoque ABS resin frame, RS-540 motor. Requires a BEC 2 channel radio & a 7.2VDC flat pack (not included). Order #10102



PEAK DETECTION CHARGER

DC quick charger with auto shut-off to trickle charge, will charge 250-1200mAh packs, small size (26.5x33.5x15.5mm) weighs 64g. Model HQ-325 (requires a 12VDC, 6 amp power source). Order #11625



ROCK BUSTER



The original Rock-buster features a RS-380 motor, rear differential, soft rubber tires, 3 speed forward & reverse speed controller. The Hopped-Up version is greatly improved. It features a RS-540 motor, new suspension and bigger tires and rims. It is designed for competition. Both require a 2 channel radio, and a 7.2VDC hump pack (not included).

Original: Kit - 21772, Assembled - 21719
Hopped-Up: Kit - 21331, Assembled - 21343

ACCESSORIES

- Pro-Ace AC/DC charger - 21727
- GP^{max} batteries: 7.2V hump - 21335
7.2V flat - 21467, 8.4V flat - 11708
- Expert DC charger - 21347



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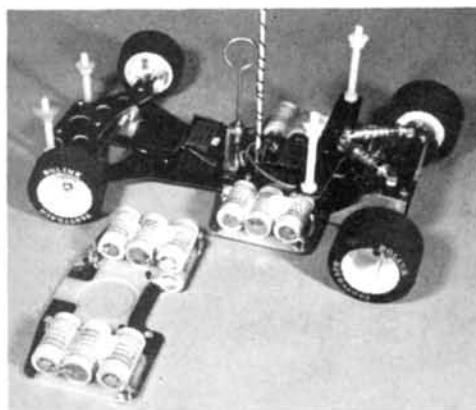
Our cars are extremely fast, but we are joking about the sound barrier.
As far as we know, no one has gone that fast with any R/C car.

ENDURO 10

stocker that handles as well as any stocker. I used Pactra* Race Paint, as this product always gives excellent results without having to sand the body or do other time-consuming body chores. The decals are from BoLINK's line of stock-car decals, and they sure bring a stock-car to life. Now to the track, to see what kind of guts this new Enduro has.

PERFORMANCE: The main feature of this car is its ability to provide competitive handling and *very fast* pit stops. That strange-looking metal loop poking out of the top near the antenna is the key to the

The Enduro handles quite well on the track, and probably slightly better than the original in the steering department. Straight-line stability is great, and its cornering ability isn't bad, but it chatters slightly because of a little flexing by the front axle. If you didn't know which you were driving, you probably couldn't tell the difference between the Enduro and the Eliminator. As I've driven the Eliminator for some time, I notice just slight differences and can verify that the Enduro will do the job without complaint, and probably better.



Two battery trays are standard with the Enduro 10; more are available for the really long races.

performance of the car. (I've been dying to tell you about this!)

That funny-looking thing serves two purposes. Imagine your car roaring along the track, when your pit crew suddenly tells you it's time for a fast stop. You head the car to the pits, where the pit man reaches for the Enduro and catches it by the loop and the bottom. In a brief moment, he can grip and raise the loop a scant 1/4 inch, allowing the battery tray to slide very slightly to the rear and to fall away. He then quickly grabs a fresh tray and slaps it into position, listening for the click of the loop as it locks the tray into position. Then he pushes the car down pit row and you're on your way—all in less than 5 seconds!

It takes a while to get used to pulling the trays away and then fitting and locking a new one. After a little practice, you're really good at this, making pit stops in 3 or 4 seconds. Now, this is *real* action in the pits; how about the car's track performance?

This is what long races are all about: race and pit, race and pit. We now have racing at its finest, with the contest shared between man, machine and pit crew. The Eliminator Enduro appears to be the first in a production line of endurance race cars for electrics. If making time in the pits is part of your game, you can either hire the Woods Brothers, or you can get the Eliminator Enduro from BoLINK. It's the first production 1/10-scale on-road electric designed both to stop and to go!

*Here are the addresses of the manufacturers mentioned in this article:

BoLINK R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.

Associated Electrics, 3585 Cadillac Ave., Costa Mesa, CA 92626.

Pactra (Plasti-Kote), 410 N. Michigan Ave., Rm. 1280, Chicago, IL 60611.

MINICRAFT

LAZER



An Up-Close Look At An Entry-Level Car

by DICK BRINTON

THE ACADEMY Minicraft* Lazer. From the graphics on the box to the beautifully chromed plastic wheels and some of the best rear tires I've ever seen on an entry-level car, I was *impressed!*

Picking the right entry-level car is a tough job for anyone, as there's a long list of them—some very good, some average and others not so good. It's very difficult to assess quality from the pictures and ads, and before you

run it, there's no way to really know how your car will perform. Yes, you can buy one like your friend's—if it meets your particular needs. But if you do this, you may miss a brand-new car with really superb features.

As I started construction, I soon began to see past the glitter, as some of the Lazer's shortcomings became evident.

The Lazer's major failure in quality is the use of plastic bushings through-

out. Plastic is a very poor bushing material, and in the Lazer, the plastic bushings fit loosely on the shafts. There's built-in play right from the start, and as dirt gets into the parts and wears them further, serious slop develops and performance quickly goes from bad to worse. After running only 10 minutes, the front axle shafts had become scored.

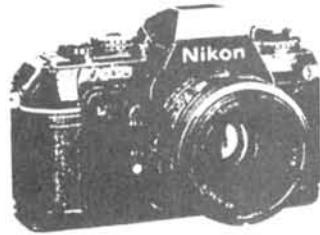
I strongly suggest that you use ball bearings in the initial construction

and toss the plastic bushings into the garbage. However, I don't know of any bearing sets available for the Lazer. You can sometimes solve this problem by measuring the inner and outer diameters of the bushings (in millimeters) and buying the correct number of loose bearings that fit the car. The Lazer uses 5x11mm bushings in the front wheels, instead of the standard 5x10mm, and I couldn't find any of

(Continued on page 94)

Wanted:

AUTHORS CONTRIBUTORS PHOTOGRAPHERS



We think a lot of our readers have ideas that are worth sharing. How many times have you read an article and said "I could do that!" or "That's not the only way to do that; mine's easier!" Could very well be! Here's your chance! We'll be expanding **Radio Control Car Action** and are looking for additional contributors to help us accomplish this objective. Of key importance is the ability to take good photographs; the writing we can help you with. Interested? It's much easier than you might think.

Let's hear from you. Send in your ideas, articles, thoughts and photos; we're looking forward to it.

**RICH HEMSTREET
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WILTON, CT 06897**

LAZER



Type Off-road
Scale 1/10
Sug. Retail Price \$89.95

DIMENSIONS:

Overall Length 15 inches
Width 9 inches
Height 5.5 inches
Wheelbase 10 inches
Front Track 6.75 inches
Rear Track 7.5 inches

WEIGHT:

Gross (w/bat.) 52.5 ounces

BODY:

Type Lazer single-seat buggy
Material Polycarbonate

CHASSIS:

Type Tub
Material ABS Plastic

DRIVE TRAIN:

Type Solid axle, pinion-and-spur gear
Differential Bevel gears

SUSPENSION:

Front: Type Single wishbone
Dampening Spring/friction
Rear: Type Solid axle
Dampening Spring/oil

WHEELS:

Front (DxW) 1 7/8 x 3/4 inches
Rear (DxW) 1 7/8 x 1 1/8 inches

TIRES:

Front Rubber grooved
Rear Rubber spiked

ELECTRICS:

Motor RS 540S
Speed Controller 3-speed rotary w/reverse
Battery Type Required 6-cell flat or hump-back

OPTIONS AS TESTED:

Radio: Jr Propo Beat 2 Alpina Pistol-grip 27MHz AM band.

COMMENTS:

The plastic bushings are very poor. Ball bearings should be substituted during construction. This car is light and accelerates well. Suspension travel is very limited, and this adversely affects handling on rough terrain.

(Continued from page 92)

the 5x11mm.

If you're considering buying a car that has plastic bushings and there are no loose bearings or bearing sets available for it, don't buy it. Car manufacturers or importers should mention the availability of bearing sets in the kit's instructions; the ones who are on the ball, do. Incidentally, though I prefer bearings, the metal bushings that come in some car kits are acceptable if you aren't out for maximum performance. However, plastic bushings are definitely out of place in an off-road R/C car.

Some of the Lazer's front-suspension parts are of a soft plastic. This may be a deliberate effort by the manufacturer to avoid using hard, brittle, plastic that breaks more easily. I'm just not used to suspension parts that flex so readily. This wouldn't be good engineering on a high-performance car, since controlling suspension movement with the spring/damper units is much more precise than relying on parts flexing.

As assembled, the Lazer has 2cm of front-suspension movement available and 1cm of rear suspension. This is certainly a bare minimum, even for an entry-level car. The rear dampers are oil filled, and damping at the front is by friction. In addition, the springs aren't well-matched to the suspension, and the car is very choppy when going over rough ground.

Here are the errors or omissions I found in the instructions:

- If you ignore the disadvantages and use the plastic bushings when assembling the diff, make sure the grooved side of the bushing is facing the *outside* of the car, or the spacer in the diff will slip into the groove and allow the gears to separate—especially under power. This is the quick way to lunch your differential gears!
- There are no directions for setting the pinion on the motor shaft. Make sure it's installed sufficiently far out on the motor shaft to fully mesh with the ring gear, or you might end up with stripped gears.
- The instructions omit parts HA-D No.

2 and No. 6 when talking about installation of the rear spring/damper units. The units won't mount without these parts, which slip onto the axle housing.

- The speed controller's "purple" wires are actually orange.
- The front body mount (HA-D No. 10)



The front friction-style dampener didn't work very well.

The rear suspension is of the solid-axle type, but on the Lazer, instead of using a ball to allow the rear suspension to tilt (this helps the car absorb the impact of hitting a bump with only one rear wheel) the Lazer uses slots and a return spring. I think this system is less likely than the ball

interference. The Beat 2 Alpina transmits and receives in the 27MHz AM band. This is a very nice wheel radio (you know I can't drive with sticks!) that really does the job.

If you buy, or already have, a Lazer, install bearings or metal bushings and



This misaligned rear spring/damper mount may fail prematurely.



Loose-fitting plastic bushing and scoring were evident after only 10 minutes of running.



Plastic bushings (left), metal bushings (right) and ball bearings (top), are the three choices for rotating friction points. The Lazer uses plastic bushings throughout.

must be installed before the front suspension installation, which is detailed in drawing 10. This step is omitted in the instructions.

- Some of the parts were in the wrong bags. It would be helpful if all parts pertaining to a particular operation were packed together whenever possible.

Besides the wheels and rear tires, was there anything I *liked* about the Lazer? Sure. For one thing, this is a mid-motor car, and the weight distribution with the battery installed seems to be just about right. The car stays fairly level during jumps and landings.

system to bind up with dirt.

I used a JR Propo* Beat 2 Alpina radio. It features a built-in Battery Eliminator Circuit (BEC), so the car doesn't have to tote receiver batteries. It also has some features that make installation in any car a snap. There's throttle and steering trim, a steering-rate adjustment (so you can dial-in the steering for different tracks) and there's a steering-wheel tension adjustment. The Beat 2 Alpina also has servo-reversing and throttle and steering End-Point Adjustment (EPA). The receiver is a 10kHz narrow-band receiver, so it should be less susceptible to

note my corrections to the instructions. You'll have a serviceable entry-level car, but without a change of spring/damper units, it won't handle well.

Next month, I'll start the "Budget Racer" series focusing on Kyosho's Raider. I think you'll find it very interesting! See you at the track!

Here are the addresses of the companies mentioned in this article:

Academy Minicraft Models, Inc., P.O. Box 3577, Torrance, CA 90510.

JR Propo; distributed by Hobby Dynamics, 3132 S. Highland Dr., Las Vegas, NV 89109.

Troubleshooting

by FRED MURPHY

READY, GET SET, GO!

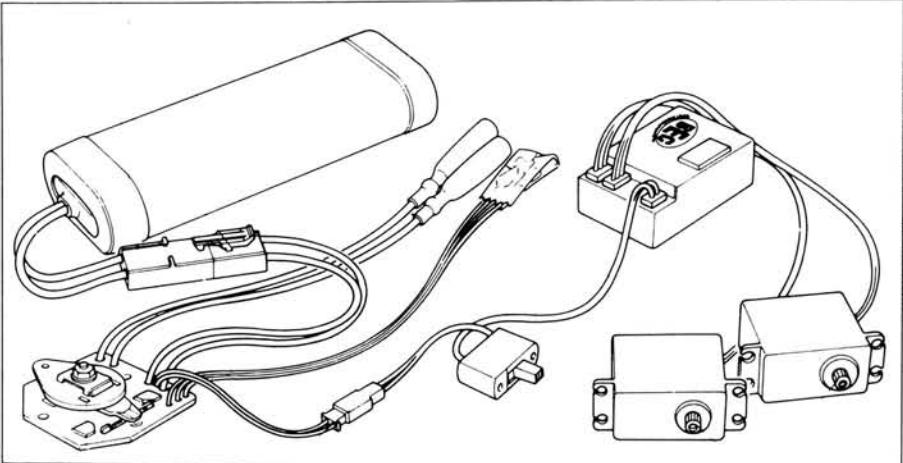
NOW THAT THE outdoor racing season has ended in many parts of the country, it's a good time to rebuild and clean your R/C car. This rebuilding and cleaning isn't only a good idea for seasonal racers, but is necessary for *all* R/C car enthusiasts.

This might be the perfect time to make that hot suspension change or put those bearings into the gearbox to add that little extra we're always looking for. The principles I'll discuss apply to all cars and might be oversimplified, so refer to your car's assembly manual if you need more details.

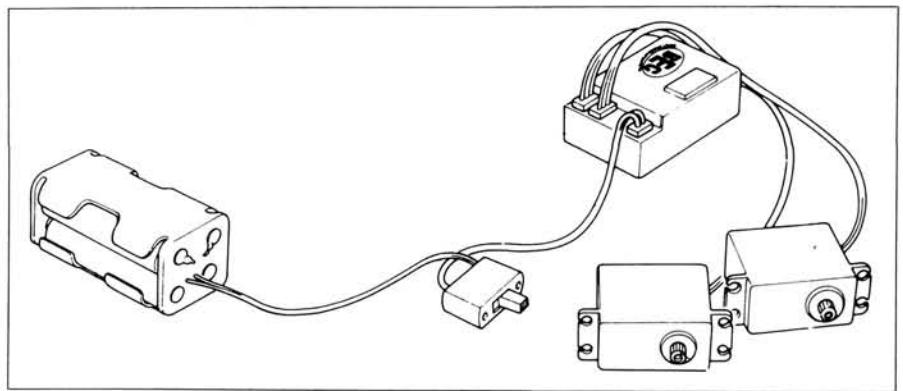
First, disassemble the car and remove the radio system. Rebuild the car from the chassis up, starting with the radio system. On your work area, lay out the servos, receiver, receiver switch or battery eliminator, and receiver batteries with speed controller (if your car has a BEC system). Wipe all the components with a soft cloth to remove dust and dirt that may have collected on them. Remove the receiver batteries and make sure the battery contacts are clean. If there's rust on the battery box contacts, it can be removed easily with fine sandpaper, emery cloth or steel wool.

For those of you with a BEC system, now is the time to inspect and clean your speed controller. Look for any signs of wear and dirt that may hinder contact of the controller's wiper arm. Once again, a small piece of fine abrasive material will help remove any oxidation, but if there are deep grooves and scratches on the controller surface, consider replacing it now to save yourself headaches later.

Check all radio-system wiring for any cracks or breaks in the insulation. They might not look like a problem now, but



Battery Eliminator Circuit (BEC) system saves weight by eliminating receiver batteries. The BEC is built into many recent radio receivers. This circuitry is also found in some mechanical and electronic speed controls and switch harnesses.



If your radio system is powered by a separate battery box, be sure to clean it out and double-check the battery contacts. In cars with very light front ends, the dry-cell pack can be a "ballast" advantage if placed forward.

annoying twitches and glitches could result from those harmless-looking cracks. Repair them now, not *after* you've lost a race due to failure. Make sure you also check the servo and switch connections on the receiver for any dirt or poor

contacts. Clean or replace the worn parts now, because shortcuts will catch up with you later.

Inspect and clean the gearbox and drive-train assembly. First, remove the

motor and check for pinion-gear damage. Make sure the pinion-gear teeth haven't been worn to a point; if they have, replace the gear.

Next, take apart the gearbox, remove the gears and bearings and clean them. To degrease the parts, use a solution of warm water and mild soap; alcohol is also very effective and won't damage the resin plastics used in many cars. After degreasing, inspect the gears and gearbox-housing parts for wear and cracks. Many modelers neglect to do this, but cracks could hinder your car's performance. Don't forget to inspect gearbox bearings and bushings for wear and binding, which can lead to major motor damage.

When you reassemble your car, keep your assembly manual handy. I know, you can probably assemble it in your sleep, but it's better to be safe than sorry. A note on greasing your gearbox: Your local hobby shop has the grease you'll need, but a sure-fire standby is automotive wheel-bearing grease. It has outstanding staying power under all conditions.

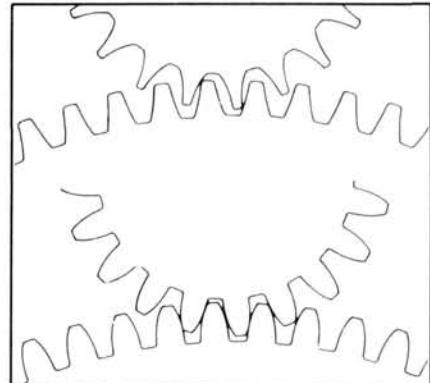
Move on to the chassis: Wash and



Inexpensive O-rings can be replaced to give your shocks new life. To retain optimum damping, annual replacement can reduce the frustrating leaks that destroy handling.

degrease the frame and continue with the front-end components. Careful inspection is required here: Examine the A-arms for cracks and wear, and check the bushings and bearings. Make sure that the tie-rods aren't bent and that the tie-rod ends and ball pins aren't worn or damaged. Replace any worn parts and reassemble, using grease in all joints to give your vehicle the new life it deserves.

As for shocks, it's a good time to replace the shock oil and check damper parts so that your racing machine will have a sure-footed ride. If you detect any binding on the shock action, make sure that the piston rods haven't been damaged or bent. If you plan to straighten a bent rod, please be careful! If you scratch the



Gear mesh (on top) shows wear that must be corrected for best performance. Correct mesh and good gear condition are shown at bottom.

rod when you straighten it, this may lead to leaking or damage to other parts, and you'll drastically hinder suspension performance.

I hope you'll find this information on general cleaning helpful. Good luck and happy motoring! ■

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ON-ROAD RC10

(Continued from page 86)

At this point, install the upper shock hardware as you would on a stock shock tower, i.e., insert a long Allen screw through the top hole of the new shock

tower from the rear. Then, install a plain nut, followed by two washers, rather than one. Finish assembly by sliding the shock with the bushing onto the Allen screw, and then install a locking nut, but don't tighten it too much.

Here's another tricky part, and it will

take a little "eyeballing" to finish the project. You'll notice that the new shock mount and the shock will rotate, thus changing the ride height. This is where the eyeballing comes in. Rotate the shock mount until you achieve the desired ride height, which is preferably as low as it will go *without* dragging the chassis on the ground. Once you've determined the ride height, tighten the locking nut on the Allen screw to hold the shock mount in place. Mark the spot on the bulkhead for the lower mounting hole. The final step is to drill another hole with the $\frac{1}{8}$ bit through the bulkhead and secure it with another Allen screw and locking nut. This will keep the new shock mount in place.

Whew! The hard stuff is over. Now I'll give you some hints on setting the car up to run circles (or ovals, as the case may be) around the competition.

You'll need some sponge tires, as spiked or knobby tires probably aren't allowed on carpet. The BoLINK* wheel and tire set and the TRC equivalent work very well. I try to run the hardest compound possible, so that the tires will last longer. Blue dot tires on all four corners usually work best. You may need to go with greens in the back to give a little understeer (push). I've found that it's

(Continued on page 108)

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H O T T R I C K

STRIPPER

AN R/C SATURDAY NIGHT SPECIAL



Track Report

Parma's '69 Camaro body is mounted on the Stripper chassis, ready for a Saturday night short-track oval.

CARS THAT WIN on the full-size Saturday-night short-track races do well because they're reliable, durable, and easy to adjust for a variety of tracks. They're not usually high-tech, exotic machines, but simple race cars with some good, common-sense backyard engineering that allows you to tailor the chassis to any track condition. The Hot Trick* Stripper is a $\frac{1}{10}$ -scale version of this principle, and they claim it can get the job done on any track from smooth carpet to dirt ovals.

The secret of this car's success is that it may be completely adjusted without really changing anything. The chassis features a battery tray/nerf-bar

plate reminiscent of the old slot-car "shaker" plates, and a rear-end pod that mounts on rubber buttons. This allows the driver to make a series of adjustments that will dial-in the car to any track. It looks hot, too, as all the parts are dyed or anodized bright red. Aside from the dye job, the front-end components are the same as those on the RC 12i cars, featuring the coil springing and rugged construction found on the original. The rear pod is a neatly formed and machined aluminum piece that allows the motor to be mounted on either side, and there are three ride-height positions for the rear axle. The main chassis plate and the standoff-mounted

battery tray are of red fiberglass board, with clean cutouts and countersunk holes.

As well as the above parts, the kit includes a front bumper made of a nylon-like sheet plastic, the nuts-and-bolts hardware and some of the rear-end components. Wheels, tires and body aren't provided.

The instruction sheet is too general and the accompanying illustrations lack sufficient detail to allow a first-time builder to easily construct this kit. The identification of several parts (some not included with the kit) is either nonexistent or too vague to be helpful, and the drawings aren't clear enough to allow recognition. For a mod-

by ERIC GOLDSCHRAFE

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HOT TRICK

STRIPPER

Type On-road
Scale 1/10
Sug. Retail Price \$99.95

DIMENSIONS:
Overall Length 15 inches
Width 9 1/8 inches*
Height 5 1/2 inches w/body
Wheelbase 10-10 1/8 inches
Front Track 7 1/8 inches
Rear Track 8 7/16 inches

WEIGHT:
Gross (w/bat.) Approx. 3 pounds

BODY:
Type '69 Camaro (not incl.)
Material Polycarbonate

CHASSIS:
Type Flat pan w/battery tray
Material G-10 fiberglass sheet

DRIVE TRAIN:
Type (prim./sec.) Spur gear (not incl.)
Differential Ball

SUSPENSION:
Front: Type King-pin w/coil springs
Dampening None
Rear: Type Rubber bushings
Dampening None

WHEELS:
Front: Type Nylon (not incl.)
Dimensions (DxW) 1.75x1
inches
Rear: Type Nylon (not incl.)
Dimensions (DxW) 1.75x1.1875
inches

TIRES:
Front Foam (not incl.)
Rear Foam (not incl.)

ELECTRICS:
Motor Revtech Pro Stock (not incl.)
Battery Required Saddle-pack
Speed Controller Tekin (not incl.)

*ROAR maximum dimension.

OPTIONS AS TESTED:

BOLINK differential, wheels and tires; Revtech Pro Stock motor; Tekin electronic speed controller; C&M body posts; Parma '69 Camaro body.

COMMENTS:

The Stripper is really stripped down—must be where they got the name! After adding lots of accessories, the car ran OK. The manufacturer claims it's good on dirt, but the dirt had better be smooth!

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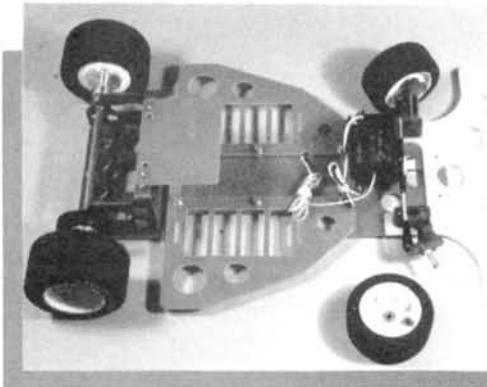
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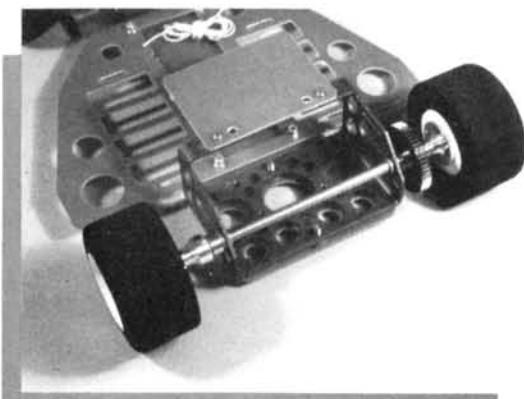
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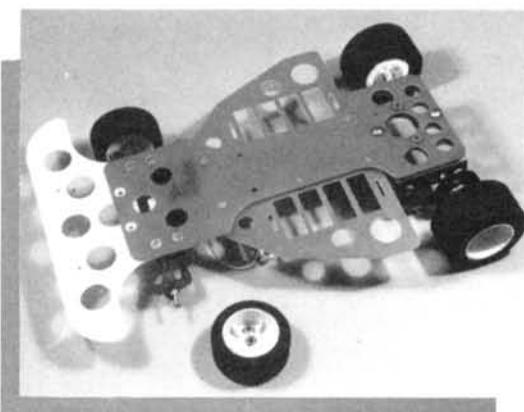
STRIPPER



The Stripper has lots of room for radio components, and the snazzy red color makes the car stand out.



Very wide track is great for cornering, but it pushes the width to the ROAR limit. Note how the rear pod rides on rubber grommets for "suspension."



Bottom view shows how the floating battery tray and rear motor pod mount to the chassis plate. Associated-style front blocks complete the package.

eler who has built an on-road car before, this doesn't present much of a problem, as most of the accessory parts required are of a standardized fit, but a novice would need some help from a dealer or a more experienced racer to finish this car.

The front-end pieces are bolted to the main chassis plate, and the front bumper is sandwiched between them. Hot Trick recommends that you start with about 10-degree caster and the stock front spring, but this seemed like a lot to me, so I inserted the proper shims to give 4-degree caster. The instructions show the RC 12i style threaded crossbar between the front-end blocks, but these parts weren't included, and the screws provided weren't long enough to mount them. Most other $\frac{1}{10}$ -scale cars using this front-end setup don't use the crossbar, and they run just fine, so I left it off. To set up the steering, I used a set of Parma* ball-end links and threaded tie rods to secure the front end to an MRC* servo-saver.

The rear pod is shock-mounted to the main chassis plate with four bolts and soft rubber cushions arranged in a diamond-shape pattern. By varying the tightness of the bolts and inverting some, or all, of the cushions, the stiffness of the rear pod may be adjusted to suit track conditions. The battery tray is secured to the chassis plate with screws and six $\frac{3}{16}$ -inch-thick spacers, and these may be changed to control chassis stiffness. Hot Trick claims that this setup will allow you to dial-in your car to any track, as long as you're prepared to experiment a little. There are no directions about how to adjust the car, but I assume that a smooth track would utilize a stiff chassis, and a rough track would require some flexibility. You have to keep the wheels on the ground to get around the corners.

The rear-end assembly uses a separate drawing for parts location, and it shows several parts that aren't included with the kit or whose function is unclear. There aren't enough

written explanations or detailed illustrations to identify these parts. You must supply your own differential parts and gear set. Nothing I had would match up to their hubs, so I used a BoLINK* diff and hubs, and a couple of steel collars to hold everything in place. This allowed for the completion of the Stripper, and installation of a Revtech* II Pro Stock motor, Futaba* R/C equipment, and a Tekin* speed control.

In keeping with the "Saturday Night Special" theme, a Parma '69 Camaro body was trimmed and painted to resemble a typical short-track street-stock or hobby-stock racer. The bright Pactra* Daytona Yellow paint was highlighted with Top Flite* Mono-Kote trim and Coverite* graphics. Some miscellaneous decals finished the job, and the body was mounted to the chassis with BoLINK 3-inch posts and C&M Mfg.* 5-inch posts. (The ones in the kit were way too short.)

The RCCA Racing Team road-tested this car at the Island Hobbies Raceway in Hauppauge, NY, where most of our on-track racing is done. The car was dialed-in quite easily, although some wider rear tires would have helped. This could present a problem, since the width of the rear-end assembly is at the legal track limits set by ROAR, and it's difficult to find a body that covers the wheels. In all fairness to Hot Trick, it should be noted that this car was apparently designed with a Can Am body in mind, and the shorter body posts and wider track would have been accommodated by such a body. Our racing series, and (as far as we can tell) many other clubs utilize the Grand National cars for on-road racing, and we've concentrated on this type of racing. Nevertheless, the rear-end pod is overly wide, limiting the versatility of this chassis and necessitating some strange parts combinations. The front bumper is quite flexible, but it tends to stay bent after being hit, and it caused us some problems while racing, as it

(Continued on page 173)

ALL-AMERICAN ON-ROAD RACING

Apple pie and R/C racing



Just as full-scale stock car racing is homegrown American-made racing, so is $\frac{1}{10}$ -scale on-road R/C racing.



The initial $\frac{1}{10}$ -scale on-road races were almost entirely stock-car oriented.

by RICH HEMSTREET

AMERICAN manufacturers have developed a new facet of radio-control racing. While the rest of the world has remained locked into $\frac{1}{12}$ -scale electrics, $\frac{1}{10}$ -scale off-road, and $\frac{1}{8}$ -scale gas cars, a truly American scale of racing has grown out of the South. At least a dozen companies are involved in $\frac{1}{10}$ -scale on-road racing. ROAR has now published rules for the cars, and four new $\frac{1}{10}$ -scale on-road National Champions were crowned in the summer of '88.

These cars are built for all-out competition. With only *minor* changes, like adding ball bearings, even the "entry-level" cars can race against the top cars. Because of similarities between them, it's natural to compare these new cars to the old $\frac{1}{12}$ -scale racers. The $\frac{1}{10}$ -scale on-road cars are easier to drive than $\frac{1}{12}$ -scale cars, and at ROAR's 42-ounce weight limit, the $\frac{1}{10}$ -scale cars are nearly as fast as the smaller ones. The suspension used on both scales is almost identical, but it works *better* in the larger scale. For racing outdoors, the $\frac{1}{10}$ -scale cars look better because they're larger, and they also race better on rough parking lots, because

pavement cracks and pebbles don't knock them off their line.

While you can use all the mini radio equipment from a $\frac{1}{12}$ -scale car in a $\frac{1}{10}$ -scale car, it isn't really necessary, because full-size servos work well in virtually all $\frac{1}{10}$ -scale on-road cars. Most racers use electronic speed controls, but there's enough room for a good wound resistor setup. The $\frac{1}{10}$ -scale cars are also easier to work on—especially for people like me, who have clumsy fingers.

Let's look at what's available in the growing $\frac{1}{10}$ -scale on-road market. My list is organized in a roughly chronological order, according to when each manufacturer entered the $\frac{1}{10}$ -scale on-road market:

- **BoLINK***: Several years ago, BoLINK started the on-road, $\frac{1}{10}$ -scale class with its Roundtracker. This car had little in the way of a suspension, and it didn't generate much interest, but it could run circles around the heavy off-road cars that tried racing on pavement. Next, BoLINK introduced the Invader, which had full independent front suspension and three coil-over shocks. This car worked very well on rough, parking-lot roadcourses.

At about the time the Invader caught on, a new racing facility was built in Orlando, FL, where Bob Hosch built a scaled-down version of Daytona International Speedway. The 384-foot Lake Whippoorwill International Speedway is the perfect showcase for $\frac{1}{10}$ -scale on-road cars, and as major events were held there, more manufacturers became involved.

BoLINK has recently introduced its third $\frac{1}{10}$ -scale racer—the Eliminator 10. The Eliminator uses independently sprung, undamped front suspension with adjustable caster. The rear T-bar flex is controlled by dual coil-over shocks, and the car is available in both graphite and fiberglass versions. At the recent ROAR Oval Nationals at Lake Whippoorwill Speedway, Steve Rule drove a BoLINK Eliminator 10 to victory in the Stock National Championship.

BoLINK'S Enduro 10 is the latest addition to its lineup. This car is specifically designed with quick pit stops for battery changes in mind. (A full review is found elsewhere in this issue.)

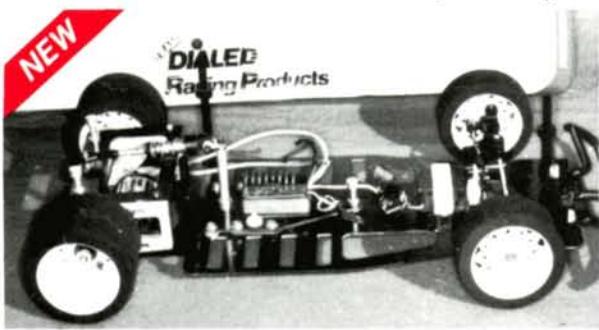
- Composite Craft* developed the Predator with an eye toward winning at Whippoorwill. Using saddle-pack batteries, the car has a graphite chassis and independent coil springs on the front end, while the rear suspension flex is controlled by another coil spring.

Composite Craft has added a new $\frac{1}{10}$ -scale on-road car to its line—the Lynx. The Lynx has no T-bar at the rear; instead, links with ball ends are used to attach the motor pod to the chassis. This

(Continued on page 110)

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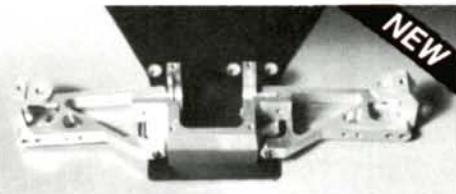
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ON-ROAD RC10

(Continued from page 100)

better to start with harder tires and to use a traction compound, e.g., those made by BoLINK, Trinity*, or Paragon*. The tires can always be softened, but it's much more difficult to make a soft tire hard. After a while, you may not need tire compound at all. The tires seem to soften gradually with use, until they just have to be cleaned off with some rubbing alcohol and a clean rag. Remember, if you use the Andy's A-arms on the front, the TRC BBS wheels will be needed to make the ROAR maximum width of 9 1/8 inches. TRC has now come out with an adapter that will let you use its 2-inch-wide BBS rear wheels and still be within the limit, so check them out. The wider wheels will give you more tire patch (to borrow a term from the television tire commercials) for increased traction and carpet-handling ability. They look great, too!

In the rear shocks, I recommend that you use CRP's* 50WT oil for a relatively stiff ride that will allow the car to corner without chassis roll. The silver springs work very well on my RC10. After all, if you want to use harder tires, the suspension can't be too rigid. Start with the shock collars approximately 1/4 inch from the top of the shock.

Finally, let's dial-in the car. Coat the tires with the tire compound of your choice, let it soak in for about 5 minutes, then wipe the tires with a rag to remove most of the compound. Finish wiping with at least one clean paper towel for each tire. If your tires are wet, you won't be very popular with the club or track owner. No wet burnouts, please!

Next, run a good 10 or 20 laps on the track to get used to the car before you make any changes. If you're lucky, you may not need to make any changes at this point. If, however, it's not quite right, I can help you to get it pretty close. If the car is spinning out (oversteering), move the shock collars up to the top to soften the rear end. This will usually be enough to correct the problem. If the car isn't turning enough (pushing or understeering), stiffen the rear shock coils by moving the collars toward the bottom of the shock. This adjustment makes the car take the turns more tightly, and it won't push toward the outside of the turn. For road courses, try to make the same changes to both sides of the car, but oval racing may require a change to only one side.

I hope you'll enjoy my suggestions; they may make the winter more bearable!

(Continued on page 112)

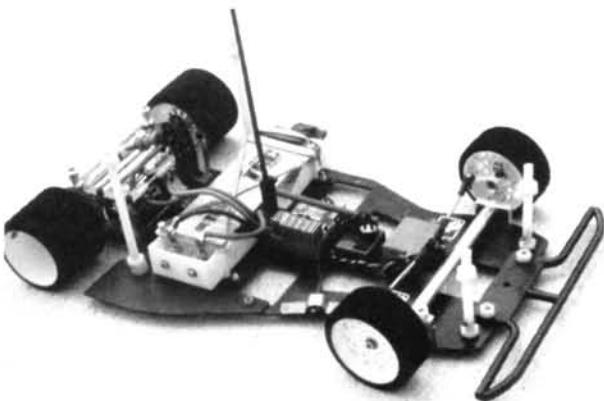
ON-ROAD RACING

(Continued from page 106)

makes for a lot more rear suspension movement than was previously available, but it also makes the car more difficult to set up. However, driven by Bob Light, the Lynx captured the '88 ROAR $\frac{1}{10}$ -scale Modified On-Road National title in Tulsa.

● Model Racing Products*: The GP10 is MRP's entry in the $\frac{1}{10}$ -scale on-road class. The car lacks durability—especially of the front suspension, but MRP hasn't had the benefit of any factory team drivers to help develop it. However, MRP has recently started to recruit drivers, and it's rumored that the GP10 is targeted for improvement.

● TRC* built the PRO 10, which is an enlarged version of its successful Pro 12 car. A bar-type front axle is used on the Pro 10, and in the rear, a coil-over monoshock controls the rear T-bar flex.



The TRC Pro 10 has been a successful racer from the time it first hit the track.

A team of top drivers showed that the Pro 10 was ready to race right out of the box.

Last summer, the TRC Pro 10 was driven to two ROAR National titles: Dennis Vindedahl won the ROAR Modified Oval title at Lake Whippoorwill, and Frosty St. Clair won the ROAR Stock On-Road Nationals in Tulsa.

● PRC's* car, the PR7, is the most unusual $\frac{1}{10}$ -scale on-road car. The car was computer designed to race on the high banks of Lake Whippoorwill Speedway, and the computer decided the car didn't need springs. The entire suspension is built into the flex of the perimeter chassis, and the battery pack is an integral stressed section of the designed suspension. Surprisingly, the PR-7 also works well on roadcourses, even in parking lots, and I've also run one successfully on a carpeted indoor track.

The PR-7 is for racers who don't want to be hassled at the track by having to tune anything beyond a portable radio. Both graphite and fiberglass versions are available.

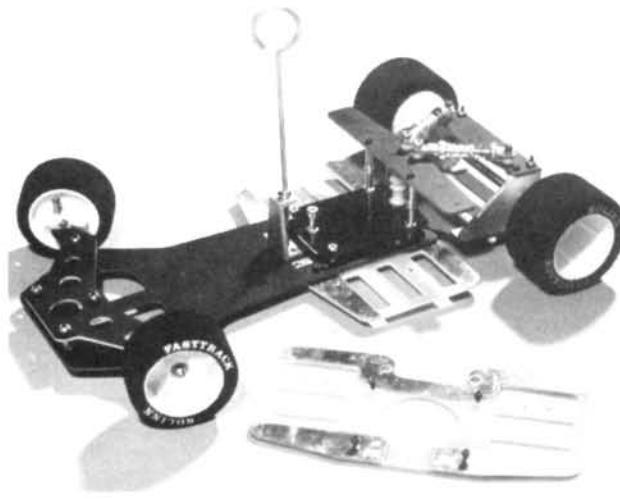
● Parma* wasn't about to be left out of the $\frac{1}{10}$ -scale on-road picture; the company developed the Pro Panther 10 series of cars for oval, roadcourse, and drag. The stock-car and roadcourse versions are nearly identical, but the bodies included in the kits differ. These cars use

controls the rolling and flexing of the motor pod. Villains are available in either graphite or fiberglass designs.

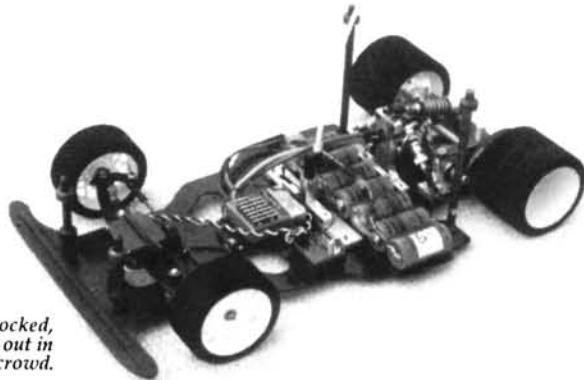
Jim Rose, driving a Delta Villain with a bar-type front-axle system, qualified third and finished third at the Stock On-Road Nationals.

● Vicfor*: Former World Champ Art Carbonell has helped Vicfor design its Concept One $\frac{1}{10}$ -scale race car. The car has a flexible T-bar to provide the rear suspension, and, up front, coil springs are

BoLINK's new Enduro 10 is the latest in the longest line of $\frac{1}{10}$ -scale on-road cars.



Belt-driven and triple-shocked, the Hyperdrive 10 stands out in a crowd.



the saddle-pack battery-mount system, and a T-bar rear suspension and independently sprung front suspension keep the tires in contact with the road.

Parma factory driver, Andy Dobson, was the third-fastest qualifier in the Modified Class at the ROAR Nationals in Tulsa.

● Delta* has long been a force in $\frac{1}{12}$ -scale racing. Now it has developed the $\frac{1}{10}$ -scale Villain on-road racer, which uses either the Delta bar-type front axle, or independent front A-arms with coil-over shocks. In the rear, the car has a triple coil-over-shock arrangement that

used with a bar-type axle. The Concept One has run well on both ovals and roadcourses. Carbonell was the third-fastest qualifier at the Modified Oval Nationals, while Steve Stiffel's VicFor was the second-fastest Stock qualifier at the On-Road Nats.

● McAllister Racing* is known for its car bodies, and now it has taken the plunge into selling a complete race-car kit. The Outlaw is described as an entry-level car. With metal bushings instead of ball bearings, the car is aimed at beginners, or, at least, at new $\frac{1}{10}$ -scale on-road

(Continued on page 176)



1/4 SCALE PRO STOCK

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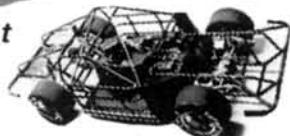


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- ★ 35cc 2.3 HP Quadra gas powered engine
- ★ Recoil starter & centrifugal clutch

ON-ROAD RC10

(Continued from page 108)

They'll also work well on asphalt, if that's where you race. Thanks to Bill Henning for the Ricky Rudd paint job, and to the gang at Henning Scale Models in Lansdale, PA, for their support.

*Here are the addresses of the manufacturers mentioned in this article:

Associated Electrics, 3585 Cadillac Avenue, Costa Mesa, CA 92626.

Parma International, 13927 Progress Parkway, North Royalton, OH 44133.

Andy's R/C Products, 466 W. Arrow Hwy., Unit K, San Dimas, CA 91773.

TRC, P.O. Box 478, Oakboro, NC 28129.

BoLINK R/C Cars, 420 Hosea Road, Lawrenceville, GA 30245.

Trinity, 1901 E Linden Avenue, #20, Linden, NJ 07036.

Paragon Racing Products, 8802 Knollwood Drive, Eden Prairie, MN 55344.

CRP, 3250 El Camino Real B-3, Atascadero, CA 93422.

POLE POSITION

(Continued from page 36)

events, but it also hosts weekly events. The Speedway has recently introduced a new division of racing to encourage new racers and those who are on a limited budget. The "Club Stock Class" uses a break-out system to limit it to club (as opposed to "expert" drivers). If any Club Stock racer goes too fast, he or she is taken out of the class and placed in the Expert Class. The limit at Lake Whip-

(Continued on page 114)

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POLE POSITION

(Continued from page 112)

poorwill is 40 laps; if a driver qualifies in more than 39 laps in 5 minutes, or goes more than 39 laps in the Main, he or she is disqualified from the Club Stock Class. The 40-lap limit was based on the capabilities of a stock $\frac{1}{10}$ -scale kit car with a \$28 NARA-approved stock motor and over-the-counter batteries. While many racers can quickly work themselves up to the 37- or 38-lap mark, it takes some experience to reach 39. At Lake Whippoorwill,

racers are permitted to use any sub-C Ni-Cds.

This type of racing is quite easy to control when you have a permanent track setup with a long performance history to chart. If your track is only a temporary setup, it might be difficult to determine the break-out point, but I encourage you to do whatever you can to bring new people into our sport.

Sportsman Cup

Trinity has just announced a new race

aimed at Sportsman drivers. The "Speed-works Sportsman Cup" is scheduled to be held on March 23 through 26, 1989, in Detroit, MI, and a "Sportsman Champion" will be crowned in both $\frac{1}{12}$ -and $\frac{1}{10}$ -scale-on-road classes. A "Speed-works" sportsman motor will be given to each racer, and no factory drivers will be permitted to race. Race Director John Thawley will watch for any "ringers" who try to slip in. This event is designed strictly for Sportsman racers—the racers

(Continued on page 116)

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POLE POSITION

(Continued from page 114)

who pay their own way and who represent the great majority of active racers today. Special seminars are scheduled for the weekend: Motor care, tuning, chassis set-up and driving will all be covered by

experts.

The race will be held on a 48x120-foot carpet track at the Plymouth Hilton, and plans also call for 10 invitational drivers to run against one another, all using the same hand-out motors. These drivers will also be available to answer the participants' questions, but the Sportsman drivers are the ones who will take away the A-Main honors. The turnout should be good for the Speedworks Sportsman Cup, and, if all goes well, the A-Main winners will be unknown to the majority of our readers!

Until next time, try to keep it off the walls! ■

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SCOPING OUT

(Continued from page 38)

unit could be costly—possibly equal to the cost of a new controller—so be careful! Other cautions to heed are the same as for most other electronic speed controls, e.g., avoid shorting across the MOSFET heat sinks that protrude from the top of the unit, and avoid getting it wet.

A final comment concerns the instruction sheet: There are enough grammatical errors (probably the result of translating Japanese to English) in the directions to cause some confusion on hookup, adjustment and operation, and these could present a problem to a modeler unfamiliar with this type of device. Kyosho's first effort at building an electronic speed controller has a few bugs

(Continued on page 128)

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MODIFY YOUR WCM SPRINTER



Photo by Bill Pagozzi

MAKE YOUR $\frac{1}{4}$ -POUNDER SIZZLE!

by BILL PAGOZZI

Starting in the early '50s, entrepreneurs like Thomson, Moroso, Iskanderian, Ed Pink and others too numerous to mention, began the hot-rod revolution with trick after-market parts for zealous teens who were casting creative eyes on their first cars. Some simply wanted a different look, others went for broke (or went broke!) in an effort to squeeze more horsepower from their engines. Regardless of the chosen route, the desire to personalize cars has fueled the custom-parts pipeline for years.

As has often been mentioned, many of the improvements in radio control (if not all) are direct results of developments in full-scale auto racing. Since the incep-

tion of R/C, scale race cars have been made to look like Can-Am, GTP, Formula 1, and NASCAR cars, as well as countless off-road racers and even street machines. But, whether it's radio controlled or full-scale, the desire still remains to give your car that personal touch to distinguish it from the rest.

Winners' Circle Manufacturing, better known as WCM*, manufactures a number of $\frac{1}{4}$ -scale R/C racing cars that are as close as possible in every detail to their full-scale counterparts. It's quite obvious that there are some areas in which it's impossible or too expensive to duplicate the full-scale cars, but these $\frac{1}{4}$ -scale cars are the closest you can get to the real thing without buckling

the five-point harness. For my ninth $\frac{1}{4}$ -scale project, I chose to build the WCM Sprint Car.

ASSEMBLY: Originally, this project started out as a basic WCM Sprinter kit, but I soon felt the incredible urge to wave my "custom" wand. The most impressive accessory I've seen for use in $\frac{1}{4}$ -scale cars is the Skellenger Engineering* Quick Change rear end. This is a scale version of the popular Hallibrand rear used in a number of full-scale race cars. The rear has an aluminum housing with a hardened-steel axle and drive shaft, which connects to the centrifugal clutch. The drive shaft runs along the bottom of the axle housing to a set of gears that's enclosed in a separate, readily accessible housing. This enables you to change the ratio without disassembling the entire rear end. The gear that's connected to the drive shaft drives the second gear, which is connected to the pinion gear inside the housing. This pinion gear drives the ring gear, which is connected to the axles. This may sound a little complicated, but it's actually a simple, durable design that has been used with great success in full-scale racing, and it's also showing promise in $\frac{1}{4}$ scale.

To install the Skellenger rear end, the engine has to be somewhat disassembled and four new holes have to be drilled in the frame (two holes in the upper crossbar, and two in the lower frame rails). When the engine is mounted again according to the SECO instructions, it must be positioned upright (not in its original, horizontal mounting position) then rotated 90 degrees, so the crankshaft is now facing toward the rear instead of the side. However, in this position, the recoil starter cord will be facing the ground. To make the starting operation a little easier, the engine is then tilted approximately 30 degrees to the right side of the car from this upright position. The exhaust is now on the bottom, and the recoil starter is up front.

As well as relocating the engine, you have to cut off the metal protrusions on the flywheel cover so that it will clear the frame. With the engine bolted into place, I found that the drive shaft on the rear end was a little too long, so it was necessary

to shorten it about $\frac{3}{8}$ inch. This is done so that the rear end can clear the rear torsion-bar tubes on the frame. (It may not be necessary in other applications.) If, as I did, you choose to mount the rear end toward the left side of the car to give it a left-turn advantage, you must shorten the left axle. On cars

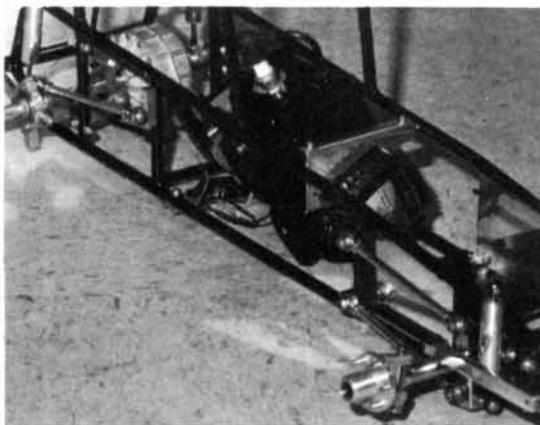
with centered rear ends, there's no need to change the length of the axles. After attaching the remaining suspension accessories, the conversion is complete.

To allow for quick tire changes, a set of Skellenger Engineering knock-offs was used. By using knock-offs, a tire change is possible by loosening only one central fastener instead of five nuts. Where they go over the rear axle, these knock-offs are split to allow them to slide over the rear axle without having to use a hammer. Once in place, two hex-head bolts tighten down on either side of the knock-offs, compressing them slightly against the rear axle and

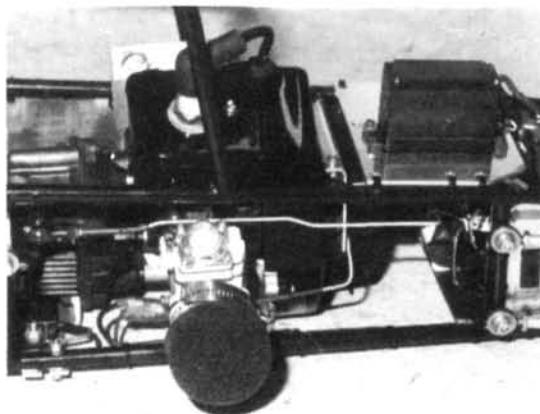
locking them into place without the use of a Woodruff key. When it was time to re-install the throttle/brake linkage, it was slightly more difficult, owing to the lack of instructions from SECO. However, Steve Skellenger from SECO informs me that he's working on instructions to be included with the kit. I elected to mount a Futaba* S-34 servo 1 inch in front of

the front engine-mounting plate by using a modified Pacesetter* drag-chute servo tray. To connect the throttle linkage to the carb from this location, the carburetor has to be turned 180 degrees from its original position. To connect the throttle and the brake to the servo, 4-40 rods were used. This requires a little soldering and a few tricky bends to get the brake rod between the engine and the carburetor. However, if it's done with neat, tight bends, you can even install the non-functional headers for a more realistic-looking sprint car.

When the linkage has been connected, all servos are plugged



Before the throttle/brake servo is mounted, you can see the engine's new mounting angle and the position of the recoil starter.



By using a Pacesetter drag-chute servo mount, the throttle/brake servo mounts neatly in front of the engine. Note: To get linkage past the carburetor, a little bending may be required.

into a RAM* No. 10 2-channel servo setter before plugging into the receiver. This is a \$35 insurance policy that will let the servos seek a pre-adjusted position during any loss of signal or battery power. I usually set them to straighten the front wheels and to shut down the engine.

WCM SPRINTER

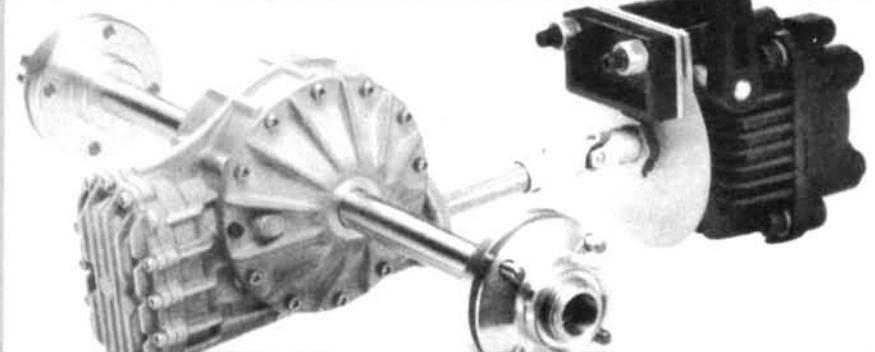
The Fagan Machine* fuel cell is another after-market accessory used to customize my WCM sprint car. This fuel cell is made of the same polyurethane material as the Simpson fuel cells used in full-scale race cars. The tank is shaped in the same configuration as the hollow tail that's included with the kit. The quick-fill screw-in cap is at the top front of the tank, just as it is on the full-size sprinter. The tank is considerably larger than the 8-ounce tank that's currently allowed by QSAC, so you might want to contact them to determine whether or not you can legally use it.

The tank is mounted by drilling three holes and installing three rubber welnuts. I used Permatex* Form-A-Gasket to

seal off the bolts that screw into the welnuts on the fuel cell. To attach the bottom of the tank to the chassis, a bracket that would attach to the tank and the rear torsion tubes had to be machined. To secure the top of the tank, I bent a piece of aluminum to attach to the rear upper side bars just behind the driver's seat. Two Pacesetter fuel fittings were installed on the front, right, upper side of the tank next to the driver's seat. This is where the intake and return lines go to and from the carb. A double filtering system (one inside the tank and one in-line filter) keeps the gas clean.

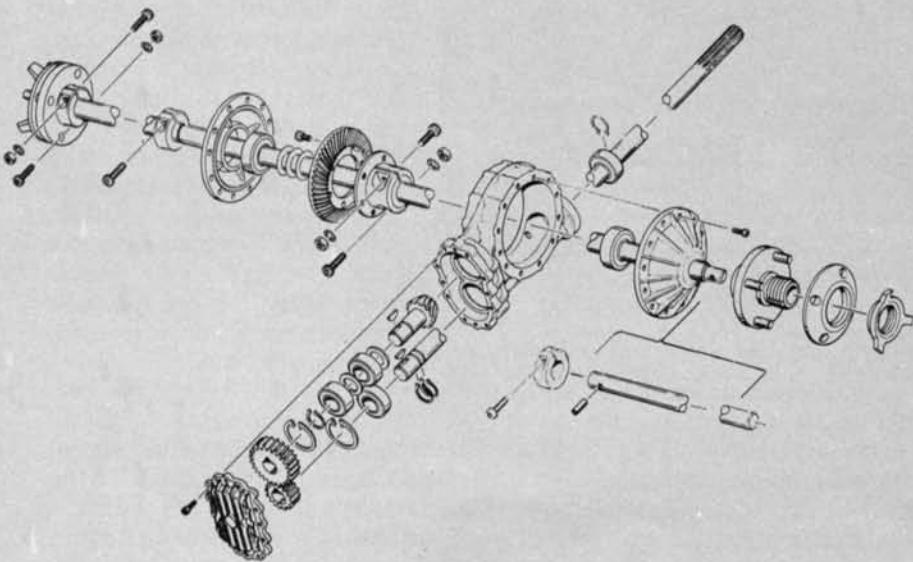
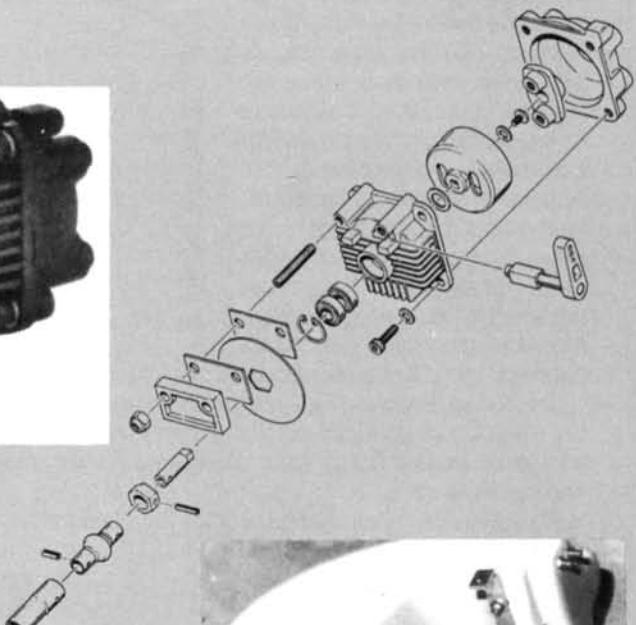
With all the major mechanical changes out of the way, it

(Continued on page 180)

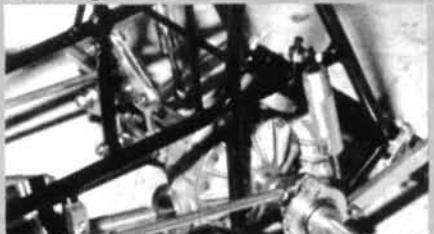


Above: With the engine facing toward the rear, power is transmitted through the clutch in the black housing and then to the rear end via the drive shaft. Note the drive-shaft-mounted disc brake. Quick-change gears are located behind the plate on the back of the axle housing.

Inset: Exploded-view drawing of the Skellenger rear end gives you some idea of what makes the wheels go 'round. The large ring gear located in the central part of the housing and the beveled pinion gear that drives it are identical to those used in full-scale racing.



To mount the Fagan Machine fuel cell to the WCM sprint-car chassis, these custom-made brackets were attached to the tank with the included grommets.



This view of the mini Halibrand just before the knock-offs had been attached shows how it was mounted to the left side of the car to pre-load the left rear tire.

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CAR FINISHING

(Continued from page 114)

ate shell in this group, and it also turned out to be the lightest at 4 3/4 ounces. The biggest glitch is the molded-on wheel-well openings; they didn't line up with any chassis I had, and trimming away from the scribed lines leaves a visible mark. Nevertheless, the body closely follows the ones used by NASCAR Olds racers, and it lends itself to some spectacular paint schemes. As I hadn't seen one done up, I decided to do the Talladega-winning car of Phil Parsons, which meant that all of the lettering and numbers would have to be done by hand.

This isn't an easy scheme to paint, particularly when it comes to masking off the body. The black goes on first, followed by the red stripe that edges the black. The color line curves around all over the car, so a lot of trial-and-error masking is required to get it right. I used Floquil paint as before, and the car received the full MonoKote treatment around the windows, along the grill and on the hood. The various logos were drawn to size and copied on vellum to provide cutting overlays for the lettering. This is an easy process, but it requires

(Continued on page 124)

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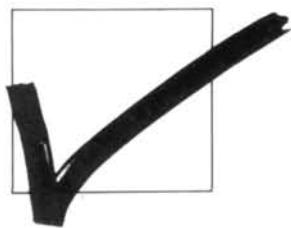
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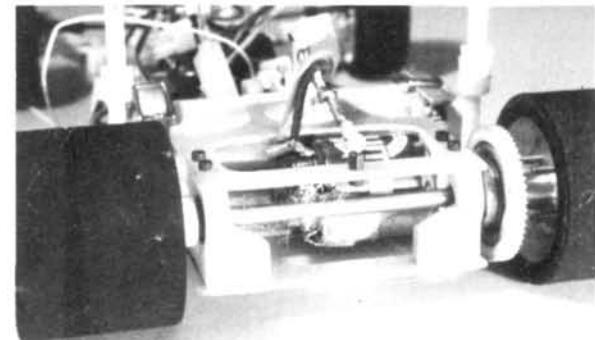
8

INSIDE VON ERICH'S GARAGE

Pre-Race Maintenance

by ERIC GOLDSCHRAFE

WHEN THE GREEN FLAG drops, the baloney stops. You may have a hot car, and you may be a good driver, but if your car isn't



Note carpet fuzz wound around axle and attached to tires, and the rubber-tire "dust" on diff gear and inside wheel. You can be sure there's more, even if you can't see it! Check the car thoroughly. Note "cracks" in tires; these are caused by tire compound dissolving the glue that holds the laminations together. Re-application of tire dressing closes gaps for racing.

prepared, you might not even finish the race. You can't let your car sit on a shelf between races and, come race day, put a quick charge on your batteries, head out to the track and expect to win.

Owing to the size of our race team, we get the opportunity to try several different cars as we prepare for the local Wednesday-night races, and we've pretty much identified the mandatory weekly maintenance that should keep your car in the leading pack all day. I usually set aside one evening a week to go over the cars completely and carefully charge their batteries. It only takes an hour or so to prep three cars, so it isn't a major undertaking, and there's really no excuse not to do it.

The first step is to take off the body and carefully scrutinize the whole chassis, looking for any damage. Check all the screws and nuts to see if any are loose or missing, and re-tighten where necessary. While

you're doing this, clean off any dirt, dust, or carpet lint that has gotten into the car. In particular, check around the bearings, behind the wheels and gears, and in the differential. After a while, even "dust" from the rubber tires will combine with oil or grease to gum up the works. With an inexpensive $\frac{3}{4}$ -inch-wide paintbrush, you'll be able to do a satisfactory job of cleaning off the dirt, even in restricted areas, but don't hesitate to disassemble a wheel assembly or pull out a motor to get out all the dirt.

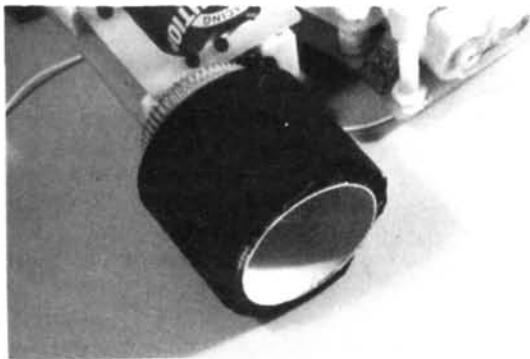
Next, check all the rolling parts and their bearings. Even if they look clean, there might be a problem caused by a bent axle or a damaged ball bearing. Check out the rear axle carefully, especially if you use a graphite part. The diff collar and adjustment stud are only glued onto the graphite shafts, and a good shot in the side from another racer can loosen them. I spent a frustrating evening trying to get the diff adjusted on one of the cars between heats, only to have the thing slip badly halfway

(Continued on page 126)

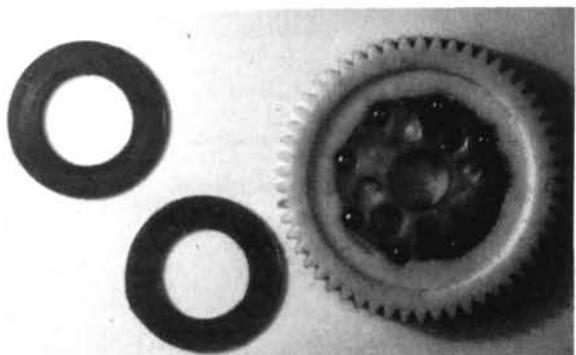
VON ERICH'S GARAGE

(Continued from page 123)

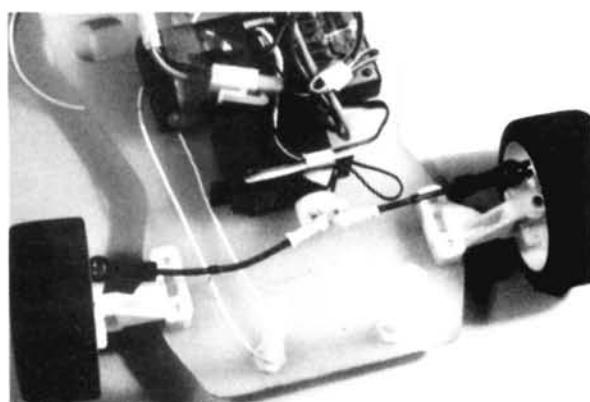
through the next race. The retainer collar had been loosened, and this caused the diff to loosen appreciably. Tightening the diff nut only shoved the collar over a little more, until all the end play was taken out of the axle.



A little friendly nerfing on the track can ruin a perfectly good set of expensive tires. Learn to drive defensively to keep your costs down; no maintenance tip will save these!



This ball diff has been ground badly because retaining collar on graphite axle loosened. Problem is relatively common, and early detection and a little glue will fix it. (See text.)



A whack to the front end bent this tie-rod, knocking it out of alignment. A rod bent this far should probably be replaced, as it will crack soon after being straightened.

that the connections are tight. The wiring should either be so short that it won't shake

By the time I discovered what was wrong, it was too late to repair it, and the car was a DNF in the Main. I've found that this is a common problem with graphite axles, but there is a cure. First, thoroughly clean the area where the parts meet (motor spray seems to work just fine), position the parts accurately, and glue them back together with ACC cement. Try not to use too much glue, as the fillet it forms could affect where the collar rubs against the bearing. I was a little skeptical about this repair's durability, but it seems to be better than new!

Any lubrication should be done with a minimum of oil or grease, as these lubricants attract dust and dirt like crazy. Dry lubricants are available, and these work well and won't attract dirt (e.g., Ultralon and Liquid Bearings from Paragon Racing Products*). Banana Lube from Dan's RC Stuff* also works well to seal your bearings against dirt and dust.

Next, check the side play in the wheels and axles, and look for any loose or worn front-end or steering components. Front-end alignment should be checked out, because a whack by another car or a collision with a wall can bend a No. 4-40 threaded rod. Set it up and test it with the radio on. I like to mark the settings on my transmitter, in case someone "inadvertently" moves it while the radio is in the impound area.

The motor should also be routinely inspected. A quick cleaning will help a lot, and you should inspect the solder joints on the wires and capacitors to be sure they're secure. Also make sure the end bell hasn't loosened, as it could ruin your whole day if it falls apart while you're leading the A-Main. Follow the wires from the motor back to the speed control, checking to see that the insulation is intact and

around during a race (but not so short that it causes a strain or tension on the soldered joints), or else tied to the chassis with tape or tie-wraps. Look over your battery packs, and check the connectors and the area where the lead wires are secured to the cells. This area is often where failure occurs; another is the on/off switch to the speed controller. Be sure to mount the on/off switch solidly, where it won't get knocked around in a crash.

The batteries should also be mounted securely, as the dead weight of the pack can become a significant hazard in a severe crash. The fiberglass chassis can slice right through the tape most racers use if the car takes a solid shot, and the battery pack will then be free to flail about inside the race car, possibly causing more damage. One way to cure this problem is to file off any sharp edges on your chassis where the tape touches it. Other devices can be used, e.g., BoLINK's* battery holders, which are designed to screw the battery pack to the chassis plate. Your main concern is that you should be able to change your battery packs in a reasonable time.

When you've finished the chassis maintenance, you can put the body back on. Check the mounting posts for cracks and tightness, and check around the body for cracks that will cause the front end to drag on the ground or the rear fenders to cut into the tires. Remember to put all the tools back into your toolbox so they're there when you need them at the track. Also be sure to replace any spare parts you've used. As you might imagine, you shouldn't wait until the night before the race to do all this; if you need to order a particular item, it could take a couple of days—or more!

I'm assuming that a lot of you are beginners, but even experienced racers have problems, and they, too, should find some of this material useful. I hope this column will get you off on the right track, and once you've licked the reliability thing, you can concentrate on winning some races. Next time, I'll go into some ways in which you can make your car run better, faster, and more competitively. Meanwhile, put the hammer down and have some fun!

*Here are the addresses of the companies mentioned in this article:

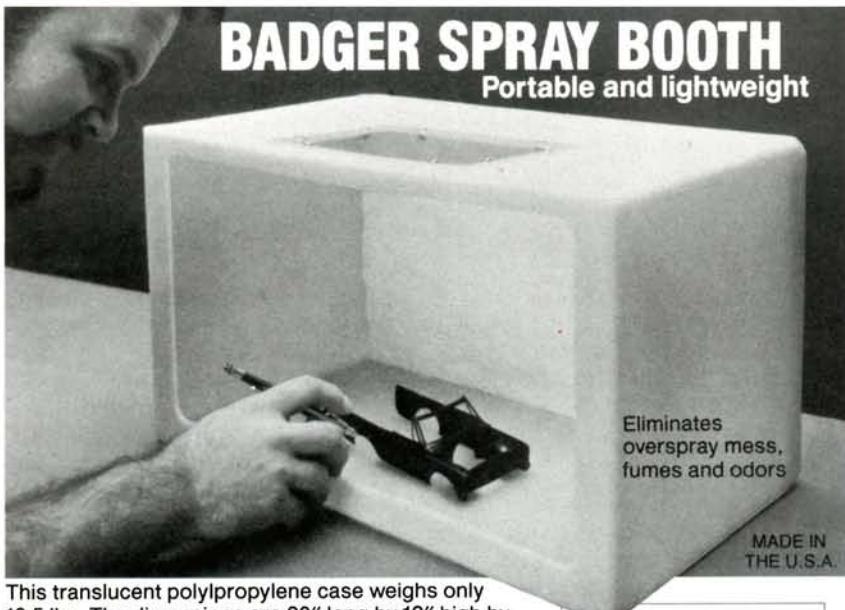
Paragon Racing Products, 8802 Knollwood Drive, Eden Prairie, MN 55347.

Dan's RC Stuff, 9525C Cozycroft Avenue, Chatsworth, CA 91311.

BoLINK R/C Cars, 420 Hosea Road, Lawrenceville, GA 30245.

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Portable and lightweight



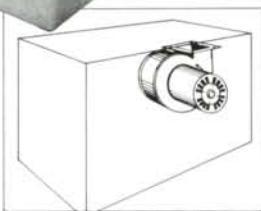
This translucent polypropylene case weighs only 10.5 lbs. The dimensions are 20" long by 12" high by 12" deep with an 8" x 5" plexiglass top mounted window to allow more direct light in. It is easy to clean and comes with a 3100 RPM inductance shaded pole blower with replaceable filter and complete instructions on venting.

See your nearest dealer or for more information write for a complete 24 page full color catalog. Send \$1.00 to cover postage and handling.

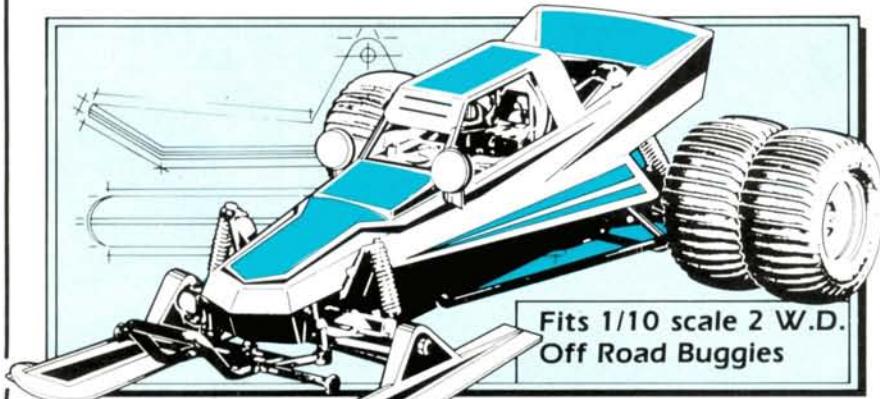


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S6V 3E9

(306) 764-6943

SCOPING OUT

(Continued from page 116)

that should be corrected in time.

*Here's the address of the manufacturer featured in this article:

Kyosho; distributed by Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820. ■

THUNDERDROME

(Continued from page 68)

As the name implies, during the 1-minute Insane Run, the object was to go as fast as you could with a minimum of rules. Previous closed-course speed records for $\frac{1}{10}$ -scale on-road cars were set at Lake Whippoorwill Speedway in Orlando, FL. Last year's record of just over 50mph was set by Joel Johnson driving his Trinity-powered TRC Pro 10, but during Whippoorwill's October '88 Car Action Weekend, Bud Bartos, driving his BoLINK Enduro, set a new speed record for closed-course racing by driving back-to-back 55mph laps. Since the Thunderdrome is roughly *four times* the size of the Whippoorwill track, with banked turns about two-and-a-half stories tall, it was easy to see that Bud's record was in jeopardy.

There were no restrictions on what drivers could do to their cars to make them run fast; they just had to run a $\frac{1}{10}$ -scale car. While a few entrants from the Gear-Case classes (e.g., the RC10, the Ultima and other competitive cars—usually of the off-road variety) gave it their best shot for hell-bent speed, the more successful cars were from the Direct-Drive Class. Each of the top 10 finishers posted at least one 50mph lap, and those in the top five repeated it a couple of times. Joel Gish, who received the "Top Amateur Driver Award" during the Car Action Weekend, netted a 6th-place finish, driving a Trinity-powered Vicfor machine. Other impressive runs included Bob Novak's average of 50mph (driving a Reedy-powered BoLINK Eliminator), Barry Hendrick's average of 50.1mph, and Rick Pruitt's 50.3mph average. (He drove a Reedy-powered TRC Pro 10.)

Even more impressive were Kent Clausen and Mike Lavacot, both driving the Reedy-powered Associated RC10Ls with 10 Reedy Ultra Sanyo SCR cells. Lavacot had what looked as though it would be the best run of the day with an average speed of 52.8mph and a best single lap speed of 54mph. But Kent Clausen was still to come, and, after his practice run on the previous day, he

(Continued on page 134)

SECOND LOOK SERIES



by FRED MURPHY

ALIVE AND LEAPIN' AFTER SIX YEARS!

RETURN OF THE FROG

IN THE PAST YEAR and a half, it has become quite evident that readers who have just "tuned in" to RCCA have missed our earlier reviews of many popular cars. The repeated requests for track reports on this car or that car in our fan mail have forced us to face this fact. So, in the "Second-Look Series," we'll reprint the original review and add an update of a car's strong points and weak points with solutions to any problems. The "SLS" will be accompanied by a mini buyer's guide of some of the most successful after-market goodies. Let us know what car you'd like to read about.



FROG UPDATE

by FRED MURPHY

THE EVOLUTION of Tamiya's Frog is another success story in the R/C market. Over the years, its sales record has been impressive, to say the least, but, as with any product, time wears out components (some faster than others), and that's the problem addressed in this update.

As I said in the "Project Frog Series," the Frog's differential is its weakest area. Since this area is subjected to the most stress, it should be the *strongest* part. Anyone who has a Frog has probably had a problem in this area, either with the differential itself or with the half-shafts and dogbones. The best solution is to replace the entire assembly with the ball differential and dogbones from Thorp Manufacturing*. These will eliminate the weak joint interaction between the stock aluminum bevel gear and the plastic planetary gear that's a major stress point, and it will also prevent any half-shaft stripping.

Thorp dogbones have been designed to stop the "rounding-out" problem that happens with the stock units, but they're only suitable for use with replacement half-shafts from the Thorp diff and not with the stock assembly.

If you haven't had any gearbox trouble, but have noticed your dogbones being rounded off, the problem is probably caused by wear on the trailing-arm supports, which allows lateral movement of the arms. Companies like CRP* manufacture replacement suspension supports that are much stronger than the stock units, and they will prevent this from happening.

You'll probably also have to attend to the looseness of the

Frog's front end. Much of the Frog's front-end play comes from the front suspension arms. You can solve the problem by installing replacement CRP suspension arms, which have a brass bushing factory-installed to take out any play. With these, you can really improve the control of your Frog.

As well as replacing the suspension arms, you should also consider replacing the stock Z-bend steering arms with a heavy-duty assembly from Trinity* that will not only strengthen the steering assembly but will also firm-up the front suspension and markedly increase steering response.

While on the subject of the front end, you should also think about using a CRP chassis stiffener to add support to it. It's a heavier unit than the stock aluminum piece, and it will prevent any flexing of the chassis nose under the worst off-road conditions.

As with any car, it never hurts to add a little "show" to the "go" by considering a hot set of after-market wheels and tires for better off-road performance, or perhaps you just want to hit the streets with a set of on-road treads and a new body? The choice is yours, but consider making improvements in those areas where time takes its toll, and make *your* Frog the best performer possible.

**Here are the addresses of the companies mentioned in this article:
Thorp Manufacturing, 380 S. East End, Unit H, Pomona, CA 91766.*

*CRP, 3250 El Camino Real B-3, Atascadero, CA 93422.
Trinity, 1901 E. Linden Ave., #20, Linden NJ 07036.*

WITH THE R/C market growing at record rates, MRC/Tamiya is about to leap again with the Frog. With MRC/Tamiya's simple, reliable design, you can go from start to finish in 26 easy steps. The two-piece ABS resin space frame provides excellent durability and protection for the radio system components while providing you with the lightness that many racers seek *after* their car is built. The suspension system is a front double-wishbone reinforced with a steel radius arm on both sides. The rear suspension is a trailer-arm setup with oil-filled adjustable dampeners for maximum flexibility.

This type of front and rear suspension combination is designed for rough roads and will enhance the high-speed straight runs and give you the added maneuverability that off-road racing demands.

THE KIT: The kit provides you with an RS-540S motor and snap connectors for power and speed. This powerplant drives a sealed gearbox that has three gear ratios to choose from and is complete with ball bearings. With gear ratios of 8.5:1 for low-speed off-roading, 7.3:1 for normal all around use to 6.7:1 for record-shattering runs, you can set up your Frog for just about any track.

The Frog sits on ribbed front tires and

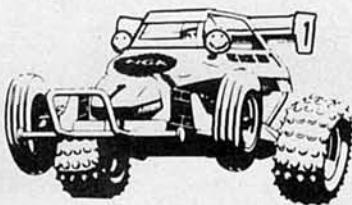
rear spiked tires held in place by the strong three-piece wheel that's so common on MRC/Tamiya buggies. Add to this the clear, tough, scale-like polycarbonate body, and the Frog kit is about as complete as any. The only additional boost might be to add ball bearings for the front wheels and the outer trailer arms.

PERFORMANCE: The overall performance of the Frog is enough to qualify this buggy as a serious off-road force. The Frog's wide wheelbase and low center of gravity result in great handling.

After a quick assembly, it was time to go to the track to see if the Frog would

(Continued on page 180)

TAMIYA



FROG

Type 2WD off-road buggy
Scale 1/10
Sug. Retail Price \$174.95

DIMENSIONS:

Overall Length 15 3/4 inches
Width 9 inches
Height 6 inches
Wheelbase 9 3/4 inches
Front Track 7 1/4 inches
Rear Track 7 3/8 inches

WEIGHT:

Gross (w/bat.) 3 3/4 pounds

BODY:

Type Off-road buggy
Material Lexan

CHASSIS:

Type Rail space frame
Material ABS resin

DRIVE TRAIN:

Type Gear
Differential Geared
Bearings/Bushings Type Ball/Plastic

SUSPENSION

Front: Type Double-wishbone
Dampening Friction
Rear: Type Trailing arm
Dampening Coil-over shock

WHEELS:

Front: Type 3-piece ABS resin
Dimensions (DxW) 1 1/2 x 1 in.
Rear: Type 3-piece ABS resin
Dimensions (DxW) 1 1/2 x 1 3/4 in.

TIRES:

Front Ribbed
Rear Spiked

ELECTRICS:

Motor RS 540S
Speed Controller Forward/Reverse
3-step

Battery Type Required 7.2V Ni-Cd

OPTIONS AS TESTED:

None

COMMENTS:

A long-term concern is the ability of the gearbox components holding up under racing stress. Chassis design is rugged and provides excellent radio protection. Stock plastic wheel bushings should be replaced with ball bearings for less maintenance and better performance.

SECOND-LOOK SERIES BUYER'S GUIDE

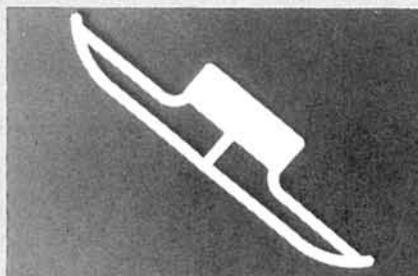
An impressive flood of after-market parts has followed the great success of the Tamiya/MRC Frog, and many of these parts may be used to address the inherent weaknesses of this off-roader. Whether you need tires, suspension components, drive-train accessories or bodies, your choices seem endless. Here are some of the parts you might want to consider.



RCRC Dog Bones are made of special lubricant-impregnated materials to give better wear than stock units.



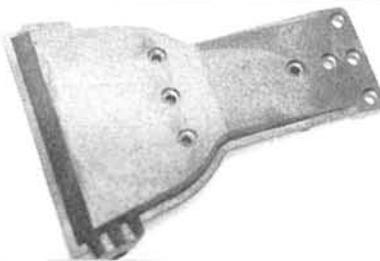
Trinity's Frog Steering Linkage Kit adds strength, eliminates steering play and greatly improves steering response.



Pro-Line's Xtra Wide Bumper helps protect the entire front end, including steering arms and tires.



The Thorp "Dirt Burner" differential ends gearbox destruction. Heavy-duty steel half-shafts prevent stripping and slipping under racing stress.



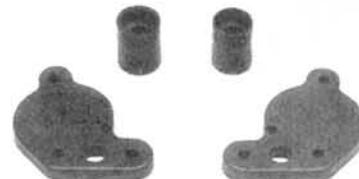
A CRP Chassis Stiffener replaces the thin, stock, aluminum unit and helps prevent the nose of the chassis from flexing, so it keeps your front tires more in contact with the track.



CRP Suspension Arms with factory-installed bushings take all the play out of your front suspension and eliminate the uncontrollable shake that forces drastic oversteering.



The Thorp Dog Bone Conversions will keep wear to a minimum and add the finishing touches to the "Dirt Burner" differential.



CRP Suspension Supports greatly reduce the wear of the rear trailing arms, while at the same time giving added support and reduced trailing-arm flex.

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#1000

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Deadline: March 1, 1989

MAIL TO:

R/C Car Action Car of the Year Contest, 251 Danbury Rd., Wilton, CT 06897.

THUNDERDROME

(Continued from page 128)

looked like Lavacot's only real threat. Clausen started with a lap of 53mph and then ran at 54mph on his second lap. The end of the third lap saw Clausen cross the line as a new record holder with a speed of 57mph! With Clausen maintaining such a blistering pace, there was little doubt that he would beat Lavacot's average of 52.8mph. Just as that thought passed through my mind, Clausen was heading down the back straight for the third turn, and a small irregularity in the track sent his car tumbling through the

(Continued on page 140)

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THUNDERDROME

(Continued from page 134)

air. After three-and-a-half rotations, his car came down on its roof! As it slid into the banked turn, it rolled upright, *still headed in the right direction!* His final laps were in the 54mph range, but he couldn't make up for the lost time and finished 2nd with an average of 52.6mph. After the Insane Run, it was time for the drivers to return to the pits to set up their cars for the 4-Minute Mains.

The races started with the lower Mains in each class and worked up to the A-Mains. The A-Main for the Road Wizard Class saw Hobie Kaptan taking the checkered flag in 1st place, but Dan Moynihan of Dan's RC Stuff also put on a first-class show. Dan's Wizard was running strongly in 1st place when a piece of tape used on the front wheels to take out some of the steering came loose and wrapped around the right side spindle. This caused his front tire to lock up on the back straightaway, and sent his car into the boards at full speed. The car hit with such force that his 6-cell stick pack broke in half.

Things went a little more smoothly in the Gear-Case Stock Class, as RC10s took the four top spots, and the Twister-powered version driven by John Boubel took top honors.

In the Gear-Case Modified Class, Eddie Knowles, who also took the TQ spot, wound up with the 1st-place trophy. Eddie's Turbo Scorpion used many stock components combined with a graphite chassis plate, a Twister motor, a Kraft radio and a JG body.

With his Race Prep-powered TRC Pro 10, Bill Martin turned in 15 laps in the Direct-Drive Stock Class for 1st place. His closest competition was John Lonero, who also ran 15 laps but was a full 6 seconds off the winning pace. (John ran a Reedy-powered Predator with a Futaba guidance system.)

The day's final Main—the Direct-Drive Modified Class A-main—was undoubtedly the fastest class. Since these cars all ran modified motors, we expected some respectable speeds, but with their low-slung, aerodynamic, Indy-type bodies, they gave us speeds that were *considerably faster* than the norm. At the green flag, the field headed for the first turn with Joel Gish sneaking into the lead and Shawn Ireland at his side. The 2nd-place qualifier, Kent Clausen, tangled with another car and spun into last place. Gish was able to fend off Ireland's attack, but he hadn't counted on Clausen coming

(Continued on page 143)

Radio Control Car Action BACK



OCTOBER '88

"INDY CAR SPECIAL"

FEATURES: Oval Nationals; Indianapolis 500; RC10 Tech, Part II; 1/4 Scale Spring Nationals; Budget Racer; Motor Break-In Machines; Car Action Weekend Preview; How To Use Liquid Mask; Tulsa One-Tenth On-Road Nationals; Fortune On A Fender.

TRACK REPORTS: Schumacher Cat; Tamiya Super Sabre; Advance Custom Street Machine; Tamiya Formula 1 Cars.



AUGUST '88

FEATURES: Trinity Shootout; Motor Spring Tension; RC10 Tech; Tire Mounting and Truing; The Budget Racer; Trouble-Shooting; Details; Dead Pool; Light System; Super Sport Preview; Talladega; Project Big Bear.

TRACK REPORTS: Advance Motorcraft; Tamiya Sonic Fighter.



SEPTEMBER '88

"DIRT OVAL SPECIAL"

FEATURES: JG Dirt-Oval Champs; Radio-Control Electric Fast Boats; Dirt-Oval Optima; Project Big Bear Part II; 1/10 Dirt-Oval Overview; Full-Scale Dirt Oval; Buyer's Guide; Night Riding; Dirt-Oval Aerodynamics; Racer's Edge; Scoop on Scoops; McLowering Kit.

TRACK REPORTS: Avante; One-Tenth Outlaw; Lazerlite Racing Systems Shadow.

THUNDERDROME

(Continued from page 140)

back from last place to challenge him for the lead. In the final laps, Clausen's car powered past Gish's and held on to finish with a 2-second margin.

Events like the Thunderdrome are a credit to R/C racing, as the emphasis is on fun and variety. Racers could run five types of bodies, and by making a class for the Gear-Case cars, those with off-road cars could compete in the same forum without having to buy another car to be competitive. For those who couldn't take home a first-place win, there was a raffle for many radio-control-related prizes.

Although the size of the track probably brought some of the lower-level transmitters to the boundaries of their operating ranges, there were very few problems, and the event was a great success. For recognizing the potential of the Encino Velodrome as a great racetrack, all credit goes to the organizers, Dan Moynihan and Gary McAllister. These tracks have a terrific potential for high-speed thrills, so if you have the itch to see tire-blistering speeds, keep your ears tuned for the next Thunderdrome. I'll see you there! ■

IT'S HERE The POWER ALLIANCE Motor Dyno



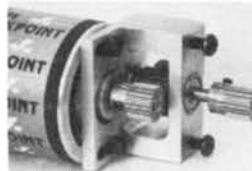
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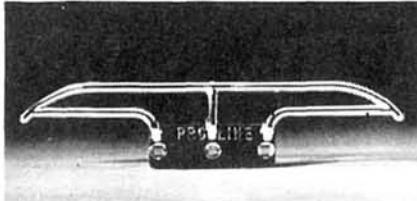
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What's New



PRO-LINE FRONT BUMPER

Pro-Line has just come out with a new chrome front bumper that's guaranteed to give your RC10 or Cox Scorpion added protection and style. Pre-drilled and ready to mount, this durable bumper is easy to install.

For more information, contact Pro-Line, P.O. Box 456, Beaumont, CA 92223.



JOHNNY V'S ULTRA KLEAN

Ultra Klean is an industrial-strength cleaner specially formulated for cleaning electrical motors and bearings. As most motor manufacturers will tell you, keeping your motor clean will extend its life and prevent performance deterioration and premature brush wear, etc. With regular use, it will also increase the durability of your bearings.

For more information, contact Johnny V's R/C Hobby Shop, 1036 West Airline Hwy., Suite 110A, La Place, LA 70068.



MRP

LOLA INDY BODY

MRP has updated its older Lola T88 Indy body; the new Lolas have an extended cowl and a longer tail. The part number, 30-1135, will remain the same, and all future orders will automatically receive this body.

For more information, contact, Model Racing Products, 18676 142nd Ave. NE, Woodinville, WA 98072.



PARMA

PRO PANTHER 12

Parma's Pro Panther 12 is now available in *graphite!* This race-proven design has been improved by the light-weight rigidity of graphite. Both the fiberglass and graphite versions contain ball bearings and ready-to-race tires and wheels.

For more information, contact Parma International Inc., 13927 Progress Pkwy., North Royalton, OH 44133.



AJ'S R/C'S CHRISTMAS TREE

AJ's proudly introduces a drag-racing Christmas-tree system for $\frac{1}{4}$ -, $\frac{1}{10}$ -, and $\frac{1}{12}$ -scale drag racing. This system is fully computerized, has dual lights and provides elapsed time, reaction time and mph. This system can also be used for bracket racing where the racers dial-in their times and try to run as close to that time as possible without going faster. The system will operate on either 12V or 110V.

For more information, contact AJ's R/C's, 2102 Guildreland Ave., Schenectady, NY 12306.



DAHM'S SUPER SPORT 454

Dahm's new racing body, the Super Sport 454, is designed to be an off-road racing truck, a monster truck, or a custom street truck. Its aerodynamic design features a swept-back front end, a custom hood scoop with vents, wide wheel wells and a tailgate wing. This heavy-duty Lexan body is designed to fit the RC10, Optima, Ultima, most monster trucks and most $\frac{1}{10}$ -scale cars.

For more information, contact Dahm's P.O. Box 386, Cupertino, CA 95015.



CRP MINI PIN SPIKES

Custom Racing Products has just introduced its new Mini Pin Spike tires for the Schumacher Cat-type wheel. These tires give much better traction when racing on hard-packed dirt, and they're also available in a narrower width for use on the front of your R/C car.

For more information, contact Custom Racing Products, 3250 El Camino Real B-3, Atascadero, CA 93422.



BUD'S RACING WHEEL HUB

This new Bud's Racing $\frac{1}{12}$ -scale super lightweight Wheel Hub will fit any Associated or TRC-type wheel. The aluminum wheel-mounting screws and drilled hub give you a lighter rotating mass for better acceleration.

For more information, contact Bud's Racing Products, P.O. Box 601, Amherst, OH 44001.



KYOSHO YAMAHA YZR 500

Just like the full-size racing bike driven by Eddie Lawson, the new $\frac{1}{8}$ -scale Kyosho Yamaha YZR 500 motorcycle captures all the excitement of Grand Prix motorcycle rallies. The Yamaha features Kyosho's unique gyro steering/balancing system that allows new drivers to drive with ease, lean into curves, and power through the straights like full-size bikes.

For more information, contact Great Planes Model Distributors, P.O. Box 4021, Champaign, IL 61820.

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4015 - 1/8 HARD BALLS 181



TEAM LOSI HARD BALLS

Team Losi wins the ball game hands-down with its new differential Hard Balls. These special $\frac{1}{8}$ -inch differential balls are made of ultra high-strength space-age material that yields a Rockwell hardness of over 75 (as much as 20 percent harder than the next-best diff ball). These extremely hard precision-ground diff balls fit most $\frac{1}{10}$ - and $\frac{1}{12}$ -scale diffs and allow you to run the diff looser for easier, more effective differential action in the turns.

For more information, contact Team Losi, 1665 E. Mission Blvd., Pomona, CA 91766.



MCALLISTER NISSAN TRUCK BODY

McAllister Racing has now added the awesome Nissan Racing mini pickup to its line of bodies. The Nissan, Toyota and Chevy Sportside pickups are all great for off-road trucking and monster trucks.

For more information, contact McAllister Racing, 2205 First St., Unit 107, Simi Valley, CA 93065.

COMPOSITE CRAFT RC10 CHASSIS

In addition to its standard and wide graphite RC10 chassis, Composite Craft now offers the standard RC10 chassis with slots for using saddle packs. The lightness and rigidity of graphite have always been of considerable benefit to all R/C cars, but now you'll be able to further enhance the performance of your RC10 by lowering its center of gravity.

For more information, contact Composite Craft, Inc., 2400 Sand Lake Rd., Orlando, FL 32809.

Descriptions of new products appearing on these pages were derived from press releases supplied by the manufacturers and/or their advertising agencies. The information given here does not constitute endorsement by **Radio Control Car Action**, nor guarantee product performance or safety. When writing to the manufacturer about any product described here, be sure to mention that you read about it in **Radio Control Car Action**.

FULL-SCALE GTP

(Continued from page 74)

½ mile. That isn't much of a distance to get a 750hp car stretched out to speed, but this isn't a drag race: *This is road racing!*

As I toured the track during practice and main-event racing, I found that the smaller GTU cars were the loudest things going! Despite their smaller engines, these mean-sounding machines get the blood pumping with close dicing and

heart-stopping action. The winner in this race was Tom Kendall driving a Chevy Beretta. It wasn't an easy race, as Kendall did what many would say was a take-out move on another driver, Amos Johnson. Kendall clipped Johnson's Mazda RX-7 on the last lap of the race, putting Johnson into the wall. The Mazda bounced off the wall and hit a Merkur XR4Ti driven by David Kruse. Both cars were out of the race, and Kendall went away to take the win.

In the GTO class, a season-long duel between two hot drivers was coming to a head. Scott Pruett in the Merkur XR4Ti had been having it out with a Toyota Celica driven by Willy T. Ribbs. These drivers had a few fender-bending meetings during the season, and in this race, they went one-on-one in the final third, and the crowd was on its feet. Lap after lap, Pruett dogged Ribbs, but Ribbs wasn't to be denied this time, as he eked out the win.

In a two-hour race, the heavy hitters in GTP competed for a place in the winners' circle, with the Lights running at the same time. The surprise of the season was the strong showing from Nissan, fielding the GTP ZX Turbo cars. Geoff Brabham led the way for the Nissan team, racking up

(Continued on page 148)

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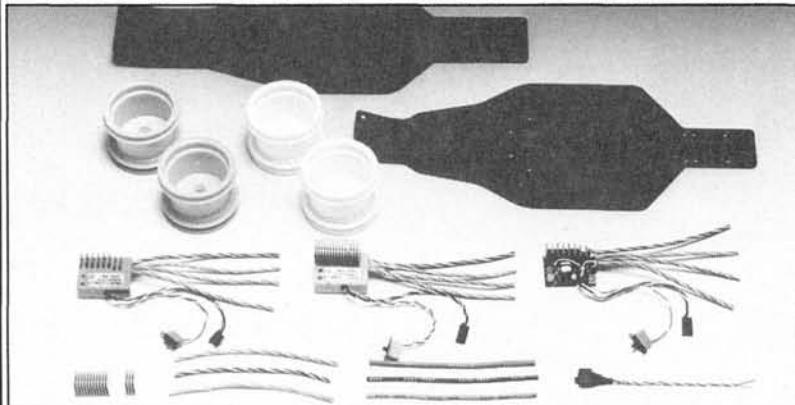
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FULL-SCALE GTP

(Continued from page 146)

an impressive nine wins in his last 11 races. This class has been dominated by Porsche for the past decade, but has recently received heavy competition, not only from Nissan, but from Jaguar and Chevrolet as well.

This race had a different twist: While Nissan and Porsche were busy trying to knock each other off, the Jaguar team had dialed-in the XJR-9 very quietly. Driver Jan Lammers of Holland put the Jag on top of things early on and began running away. It wasn't until halfway through the race that the Nissan and

Porsche drivers realized what was going on. Suddenly, the chase was on—and the fox was the Jag.

Nissan's hopes were destroyed early in this race, when Brabham tucked his nose under the Porsche of Klaus Ludwig, missed a high-speed turn and turned his Nissan GTP into smoking rubble. Brabham survived the smash-up with a bruised leg and a ruined day at the races.

A yellow flag stopped the fast action for a while, allowing the field to bunch up on the leading Jag. With a quick pit stop and change of driver, the Jaguar fell back into the pack with the Corvette GTPs and the Porsche 962s. When the flag dropped, the Jaguar was caught in a drag race down the main straight with another 962 driven by Bob Wolleck. Wolleck made the take-out move on the Jaguar, forcing new driver, Martin Brundle, into the track over-run area. Now at the back of the pack, the Jaguar team showed the field what kind of guts it had, as Brundle charged right back to the front in an amazing 21 laps to take a decisive win.

Events like this provide ideas for paint schemes that we can duplicate on our R/C models for the ultimate in realism. The colors are bright and vivid, and they

(Continued on page 150)

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FULL-SCALE GTP

(Continued from page 148)

inspire great-looking model bodies. Even the sponsor decals are easy to duplicate, because many can be found at your local hobby shop.

For me, the Grand Touring Class is the ultimate in racing. Naturally, very few of us can afford a \$250,000 race car, but the next best thing has to be reproducing them in model cars and racing them at the local track. Even now, I can hear the

sound of my $\frac{1}{10}$ -scale road car shifting gears and heading down the straight. This is where the action is!

PRO STOCK

(Continued from page 79)

The 35cc Quadra motor transfers power with a belt-drive system to a centrifugal clutch that permits easy one-pull starts, a very smooth idle and fast acceleration, which is vital in drag racing. The clutch system transfers engaged power to the axle via a 43-pitch chain that runs very smoothly and surprisingly quietly. I think the belt-drive system is relatively new in this type of car, and in our track testing, it has so far proven to be very efficient and trouble-free, giving no hint of possible future problems. The system allows the clutch to engage smoothly and seemingly much faster than a chain system, because there's no play.

In addition to fast acceleration, another area of concern in drag racing is *stopping*. The brake system on the New Era car is a dual-disc system comprised of twin fiber-glass rotors with aluminum brake pads that really do the job. The stops are quick and sure with very little heat build-up, so glazing of the brake-pad surface will be

(Continued on page 167)

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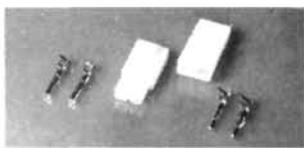
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PRO STOCK

(Continued from page 150)

kept to a minimum for as little brake maintenance as possible.

The body on the Pro Stocker we tested is the new IROC-Z Camaro with the very modern Pro Stock hood scoop. It's constructed of hand-molded fiberglass, and great details give scale realism. Available in six colors, you can paint the fiberglass body to match your favorite pavement-pounder, or run it as is. If you decide to dress it up, Parma International* has recently introduced a line of $\frac{1}{4}$ -scale decals that includes sponsor decal sheets for NASCAR racing, and an oval-racing sheet, which provides just about all the smaller fender decals that are also used in drag racing. As for the major sponsors, since only a limited number have granted marketing rights of their logos to companies like Parma and Pro Cut Decals*, you might have to spend time making your own decals, as I did.

Here's the easiest way to make decals: First, buy a roll of Black Baron Presto from Coverite*. Available from hobby dealers, it's a fuelproof, waterproof micro-thin covering film that stretches around corners for pin-stripping jobs. Find photos of your favorite car and have them

(Continued on page 171)

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DIRT DIGEST

BLACKFOOT FRONT-SUSPENSION FIX

by BILL O'BRIEN and BOB KANE

AS PROMISED, we're starting this month with the Blackfoot, one of the most versatile trucks on the market. There's also some advice for Alien owners on how *not* to treat your car if you want it to last, and, if you happen to own a Big Grizzly, read to the end.

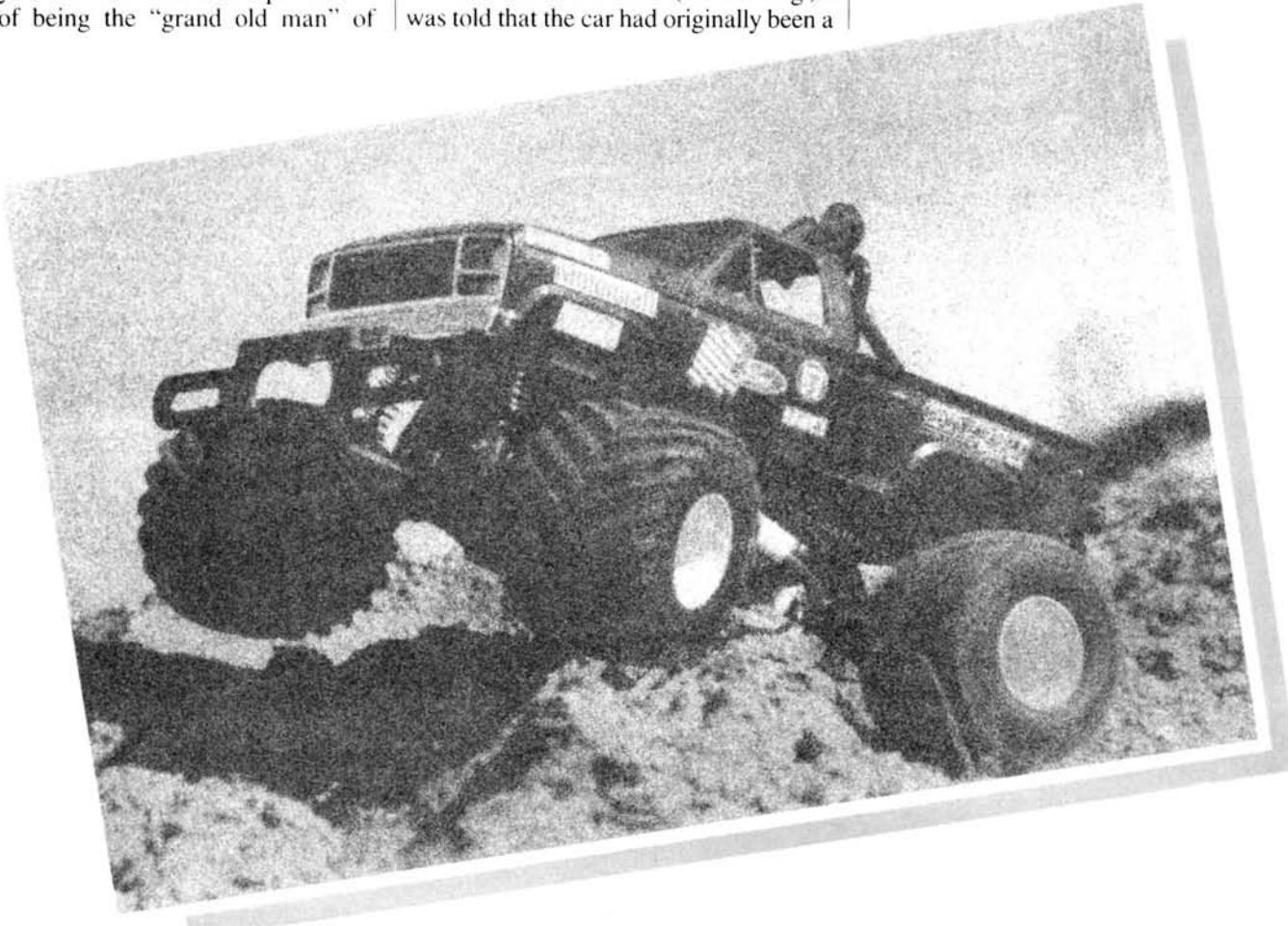
Curing the Weak-Kneed Blackfoot
Tamiya's* Blackfoot has the unique distinction of being the "grand old man" of

monster trucks. Its low price and excellent speed make it a good first truck for many people, but it has another distinction that's less appealing: It's based on one of the *oldest* chassis available.

I bought my first R/C car three years ago. It wasn't much more than a chassis with wheels, and it looked really (ab)used. Fifty dollars bought me the car and a 3-channel Futaba stick radio (not working!). I was told that the car had originally been a

Lancia, but it had been discontinued. In restoring the vehicle, I discovered that it was currently called a Frog. Restorations are usually twice as costly as buying a new car, but they enable you to make the same improvements that you'd make to a new vehicle, but *without* feeling the guilt.

Imagine my surprise when I bought my Blackfoot, opened the box and found the



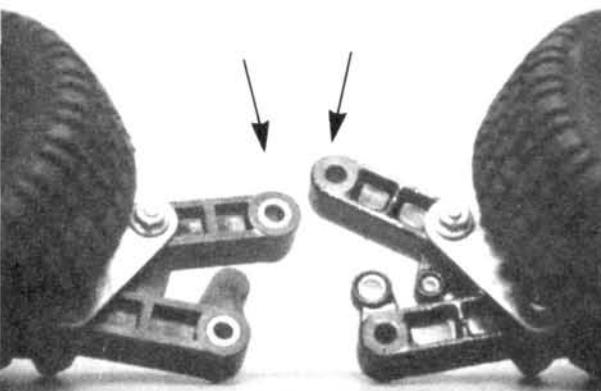
same chassis. The steering arms were larger, and there were a few extra cover-up parts to keep the mud off the radio equipment, but at the heart of the Blackfoot was a Frog/Lancia. And after a few hours of car crushing, during which the front end was subjected to a good pounding, I had a much better idea of why a car chassis doesn't really make a great truck chassis. The front end was a total mess. I could deflect the giant front wheels about 5 degrees without affecting the steering servo. My Blackfoot had a great case of simultaneous, constantly variable toe-in, toe-out and camber.

The stock replacement parts I'd used on the Lancia seemed out of the question; I knew they just wouldn't handle the punishment I thought a truck should be able to take. I found the solution in a Tower Hobbies* catalog, in a list of the products from Custom Racing Products* (CRP), which sells the ideal replacement suspension arms. These parts are stock in all ways but one. Where the Tamiya units are simply drilled through, and the plastic makes direct contact with the metal retaining bolts, the CRP units have bronze bushings that not only provide a smoother metal-to-metal contact, but also take a lot more abuse. If you add CRP's shims to the existing steering knuckles and its suspension arms to the front end, you'll have something you never thought possible on your Blackfoot: durable, precise steering control.

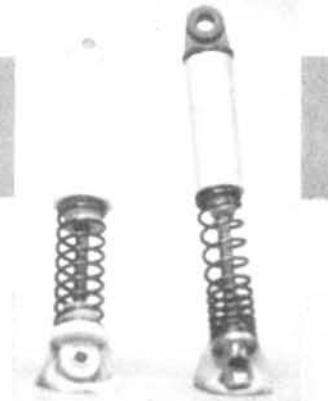
Alienated

My first 4WD car was a Hirobo* Alien. Two years before everyone else thought it was fashionable, Hirobo sold the Alien as a mid-engine vehicle and it worked. (It's faster than an Optima Mid, if they're both running 360ST motors.) But Hirobo's Alien doesn't have a positive wheel-locking system; you just keep tightening the wheel nut until the wheel is forced against a knurled thrust bushing. The raised edges on the face of the bushing literally dig into the wheel and hold it in place.

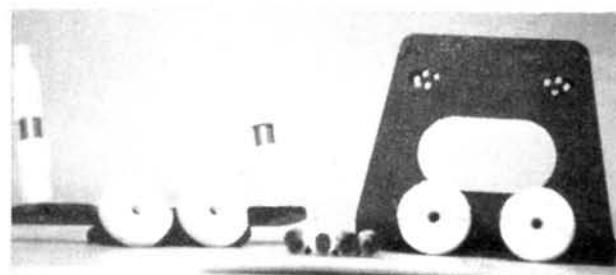
Unfortunately, somewhere between the time when the nut starts to tighten and long before the wheel is firmly in place, the entire assembly, dogbone, differential, etc., starts to spin right along with the wrench. I'm embarrassed to admit that my solution



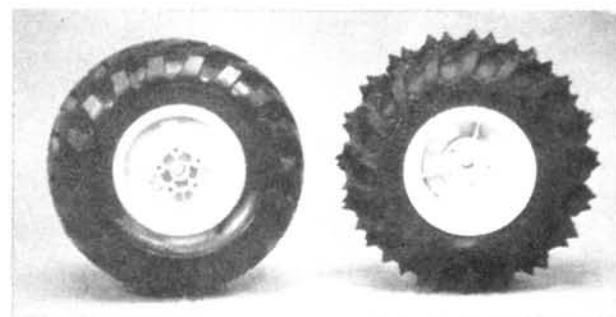
The bronze inserts in the CRP replacement suspension arms show almost no wear, while the stock Tamiya units on the right are already going out of round. These arms were liberated from a Frog and have been installed for an equal length of time.



The stock Grizzly shock absorber on the left, and a shock from an early Tamiya Lancia (predecessor to the Frog) on the right. The Lancia unit is no longer available, but the shock components can be found on Tamiya's Bruiser and similar springs are available from CRP.



The basic Optima Mid truck conversion kit from JG provides a no-nonsense installation. The low parts count (four wheel adapters, two mounting bars, posts and spacers) guarantees a short conversion time (about 20 minutes) and an equally brief disassembly time, if you want to run your Optima as a car again.



Wheel offset is obvious in the photo. The Blackfoot wheel on the left has extreme positive offset, bringing the mounting point directly beneath the inside edge of the rim. The Wildebeest wheel on the right has a more neutral offset, placed almost directly along the center line of the wheel. Wheel adapters add positive offset and, in the case of the Tamiya wheel, can severely strain the axles and bearings during hard runs.

was to grab the dogbone with a wrench and hold the parts in place while I tightened the wheel nut. Of course, this scored the dogbones and, after a while, it even caused one of them to warp. Unfortunately, I've seen three other Aliens with the same problem.

While many of you already know what to do, during the excitement of setting up your first new car, it's easy to overlook a simple solution. Rather than using a pliers or a similar implement of destruction on the dogbones, just slip a flat-blade screwdriver into the slot of the axle shaft at the differential. Brace the screwdriver against a suspension arm, and you can then turn the wrench until the wheel nut is snug, without moving the rest of the drive train.

A Grizzly Problem

One of the first things I did with my Grizzly

was to run the monster out into the water. Varicom* said it would float (and move!), I wanted to believe them, and I wasn't disappointed. Only when I ran it on dry ground did I start to have doubts.

The Grizzly's most notable features are its huge tires and wheels. They give it the floatation it needs to paddle across water, but they also impose a severe weight penalty. You can compensate for that with a rigid chassis and strong springs, but the Grizzly has *neither*. As a result, when the Grizzly lumbers along the ground, you'll notice that the front tires tend to tuck in at the top and splay out at the bottom. Steering and acceleration can both suffer when that happens.

While you probably don't want to

(Continued on page 182)

PRO STOCK

(Continued from page 167)

enlarged on a copier to the size that best fits your needs. Next, take a piece of tracing paper and trace your enlarged copies. Make as many photocopies of the traced material as you need—three, if you need one for each door and one for the hood. Now, all you have to do is to tape down the copy on top of a piece of Presto film, and then cut out the letters with your hobby knife. I think you'll be amazed at your results.

I think 1989 will start a new era for $\frac{1}{4}$ -scale cars of all kinds, with more and more events and participation than ever before. The cost of $\frac{1}{4}$ -scale cars isn't as great as you might think; many of us have more invested in our $\frac{1}{10}$ -scale electric cars than we'd have to spend on a $\frac{1}{4}$ -scale model. The cars are big, the events are big and the thrill of handling these machines is even bigger.

Unfortunately, owing to winter conditions in New England and the fact that drags strips here are closed for the season, our Camaro's timed runs and top speeds haven't been verified, but indications are that the Pro Stockers can consistently run at over 50mph. As soon as the tracks open and the *Radio Control Car Action*/Levi Garrett Camaro makes its first 1989

(Continued on page 173)

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PRO STOCK

(Continued from page 171)

track appearance, we'll bring you an update. With preliminary 1/4-scale Pro Stock racing rules now a reality for the '89 season, the competition should be abundant and very exciting. See you in staging.

*Here are the addresses of the manufacturers mentioned in this article:

New Era Models, Inc., P.O. Box 7378, Nashua, NH 03060.

Parma International, Inc., 13927 Progress Pkwy., North Royalton, OH 44133.

Pro-Cut Decals, 415 Poteet Lane, Mechanicsville, VA 60616.

Coverite, 420 Babylon Rd., Horsham, PA 19044.

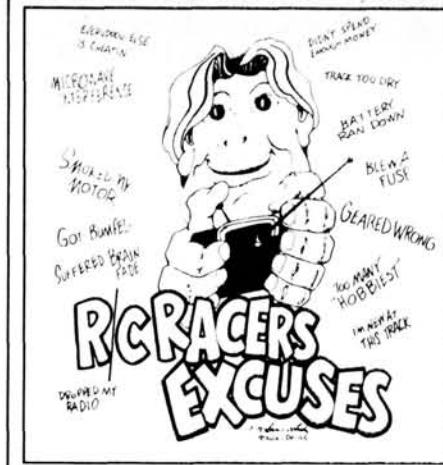
STRIPPER

(Continued on page 104)

dragged on the ground. Otherwise, the car is competitive, easy to drive and solid enough to stand up to the rigors of hard racing.

The Stripper worked well on a carpet track. It should also work on very smooth, dirt ovals, but watch out for ruts. Hot Trick's entry into the 1/10-scale on-road field is a little rough as a package, but, if you have spare parts, you may want to check it out.

(Continued on page 174)



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STRIPPER

(Continued from page 173)

*Here are the addresses of the manufacturers mentioned in this article:

Hot Trick Racing Cars, Inc., 1157 Cushman Ave., San Diego, CA 92110.

Parma International, Inc., 13927 Progress Parkway, North Royalton, OH 44133.

MRC/Tamiya, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.

BoLINK R/C Cars, Inc., 420 Hosea Rd., Lawrenceville, GA 30245.

Revtech R/C Products, 7401 White Lane, #19, Bakersfield, CA 93309.

Futaba Industries, 555 W. Victoria St., Compton, CA 90220.

Tekin Electronics, Inc., 1027 Trepadora, San

Clemente, CA 92672.

Pactra (Plasti-Kote), 410 N. Michigan Ave., RM 1280, Chicago, IL 60611.

Top Flite Models, 2635 S. Wabash Ave., Chicago, IL 60616.

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ON-ROAD RACING

(Continued from page 110)

drivers, who may have bearings from another car that will work. A monoshock-type rear end is designed so that a Delta coil-over, oil-filled shock can be bolted in later. The popular bar-type front end is used, and the Outlaw will run on either stick or saddle-pack batteries. A McAllister stock-car body is included in the kit.

• Lazer Lite's* Shadow 22 is yet another new entry in the on-road field. Lazer Lite has given its rear suspension the name of "Vari-Just," and claims the car can be tuned to run either on ovals or road-courses. Individual suspension blocks are used on the front of the car, and there's a T-bar at the rear.

• S.S. Industries'* Hyperdrive 10 is a new car with a new approach to getting the power to the track. The motor is mounted on the left side of the motor pod, instead of on the right. A pulley and notched belt are used in place of gears, and an extremely large range of gear ratios is available.

The Hyperdrive 10 uses a triple-shock setup to control the rear suspension, while, unlike most cars, the independently sprung front suspension has the servo

(Continued on page 178)

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ON-ROAD RACING

(Continued from page 176)

mounted in front of the steering linkage, rather than behind it.

For the car's national debut, Ralph Burch Jr. qualified fourth fastest at the '88 $\frac{1}{10}$ On-Road Nats in the Modified Class. Don Cooper qualified his Hyperdrive fourth fastest in Stock and finished in second place at the Nats.

Hyperdrive really showed its potential at the Second Annual Car Action Weekend when Burch captured the pole and ran away with a nine-lap victory in the 200-lap A-Main.

• C&M Manufacturing* now produces three versions of its Cobra, and it's available with either a fiberglass or a graphite chassis. The car uses a rear T-bar and 12L-style sprung front blocks, and it easily accommodates saddle packs or stick packs. These cars seem to be very easy to hook up, and even the lowest-price kit has full ball bearings.

• Advanced Racing Technologies'* $\frac{1}{10}$ scale on-road entry is the Lucas Agitator. Three coil-over shocks are used to control the rear suspension, and the front suspension offers both camber and caster adjustments. A raised chassis-stiffener plate

runs down the center of the Agitator. Saddle-pack batteries are used on this car.

• Hot Trick's* new $\frac{1}{10}$ -scale on-road car—the Stripper—uses rubber grommets for the rear suspension. Up front, 12L-style suspension parts are used. (For more information, see Eric Goldschrafe's review elsewhere in this issue.)

• Associated Electrics'* motto seems to be, "We will sell no car until it's ready and tested." Last summer, an unofficial prototype Associated $\frac{1}{10}$ -scale car captured TQ honors at the On-Road Nats, and, more recently, three official prototypes raced at the Thunderdrome. (See race coverage in this issue.) The new RC10L is apparently very close to becoming a production reality, and, like all Associated cars, it should be competitive right from the start.

Tenth-scale on-road racing has an exciting future. With so many factories involved in active racing programs, top drivers attend all the major events. BoLINK started it all, and no one sees an end in sight. The $\frac{1}{10}$ -scale on-road manufacturers have come to know the meaning of the old NASCAR saying, "Win on Sunday, sell on Monday."

*Here are the addresses of the companies mentioned in this article:

BoLINK, 420 Hosea Rd, Lawrenceville, GA 30245.

Composite Craft, 2400 Sand Lake Rd, Orlando, FL 32809.

Model Racing Products, 18676 142nd Ave NE, Woodinville, WA 98072.

TRC, 2211 Charter St, Albermarle, NC 28001.

Precision Race Cars, P.O. Box 2544, Titusville, FL 32781.

Parma, 13927 Progress Pkwy, North Royalton, OH 44133.

Delta Manufacturing, 27 Race Car Court, Lorimar, IA 50149.

Vicfor, 2646 W. 84th St, Hialeah, FL 33016.

McAllister Racing, 2205 First St, No. 107, Simi Valley, CA 93065.

Lazer Lite, 2090 SW 71 Terrace, Unit H8, Davie, FL 33317.

S.S. Industries, 3210 Howard Nickell Rd, Fayetteville, AK 72703.

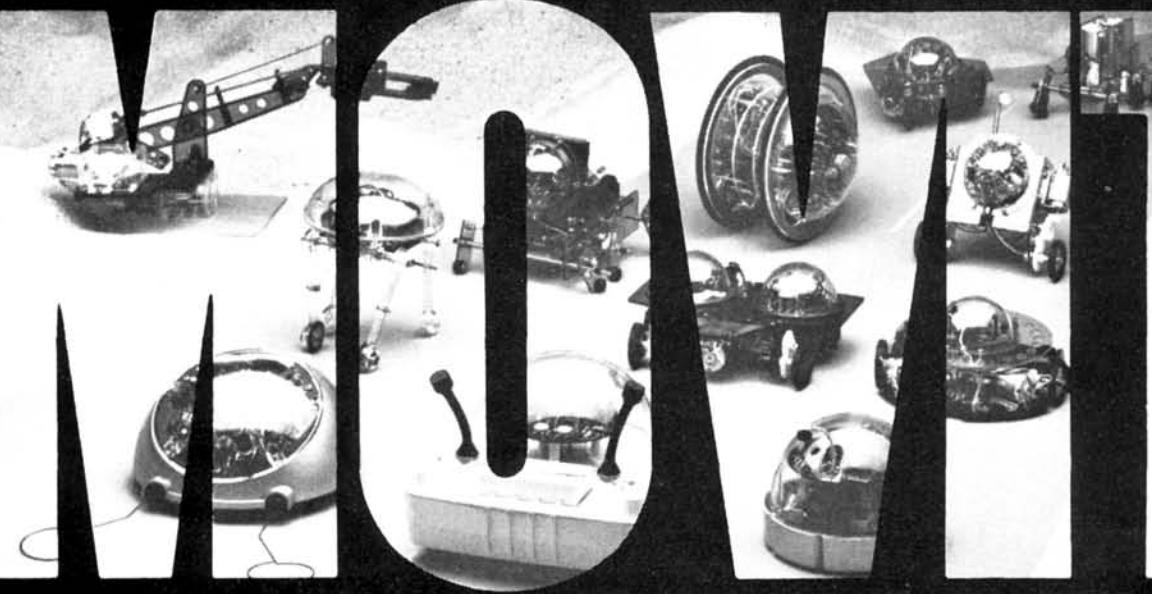
C & M Manufacturing, P.O. Box 680-233, Park City, Ut 84068.

Advanced Racing Technologies, 460 Cypress Lane, Suite F, El Cajon, CA 92020.

Hot Trick Racing Cars, Inc., 1157 Cushman Ave, San Diego, CA 92110.

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WCM SPRINTER

(Continued from page 120)

was time to give the car a good paint job. Since the tank is made of polyurethane, it's flexible, and that had to be taken into consideration before painting. The fuel cell was sanded well and then primed with PPG elastomeric primer/sealer. The tank was then wet-sanded and painted with PPG Starthane. The fiberglass front body section was primed with PPG epoxy primer, wet-sanded and then painted. The aluminum wings were prepared with Amchem Alumiprep before being primed with epoxy primer, wet-sanded and painted.

Detailing was the final step. By this time in the assembly process, you'll understandably be tempted to use decals! However, taking a deep breath, I gathered my scattered thoughts and concluded that this machine deserved the magic stroke of horsehair. I also concluded that this was a job for someone else! My good friend Frank Sprentz of the John Kasmarik Sign Co., McKeesport, PA, did a remarkable job of duplicating these logos in 1/4 scale, and if you want the same, there's probably a talented stiper in your area.

PERFORMANCE: Finally, it was time to run this beast. I couldn't wait! I really ended up with a lot more than I'd bargained for. The car was smooth and stable, and the slight increase in weight due to the SECO Quick-Change rear end wasn't very significant. To avoid any additional excess weight, I didn't fill the fuel cell, because I wasn't planning to drive the car for three weeks non-stop! However, I had to increase the height of the rear end slightly, because the slight weight increase kept the left rake of the car the same. In any event, the car has excellent acceleration, so dispelling the myth that the gear drive might slow the

car. As a matter of fact, this axle assembly is included with the formidable Edelbrock/DeLara Performer sprint car, and perform it does! Nevertheless, this is a definite improvement over the stock belt drive. There's no worry that the belt will become glazed, loosen and slip, or simply break at the worst possible moment.

Hats off to Skellenger engineering and Fagan Machine. After building nine 1/4-scale cars, I highly recommend these two, quality, after-market accessories.

Here are the addresses of the companies mentioned in this article:

Winners' Circle Manufacturing, Route 2 Box 207A, Buffalo, TX 75831.

Skellenger Engineering, 2329 South Otis, Santa Ana, CA 92704.

Futaba Industries, 555 W. Victoria St., Compton, CA 90220.

Pacesetter Products, 930 W. Hyde Park Blvd., Inglewood, CA 90302.

RAM, 4736 N. Milwaukee Ave., Chicago, IL 60630.

Fagan Machine, 2521 Winslow, Arlington, TX 76015.

Permatex, 18731 Cranwood Pkwy., Cleveland, OH 44128. ■

RETURN OF THE FROG

(Continued from page 132)

leap up to its reputation, or croak. The warm-up laps went smoothly, with only slight oversteering that was easily adjusted in the Frog's front suspension. Owing to the adjustable caster angle that's designed into this buggy, any oversteering or understeering can be dealt with easily. The Frog's front arm is held in place with a locking cap screw that will allow for change in caster angle. By increasing this angle to over the usual 90 degrees, the steering response and oversteering problem are easily compensated for.

The test car is equipped with the 18-

tooth pinion gear and 50-tooth spur gear for a gear ratio of 7.3:1 (the normal setting according to the MRC/Tamiya instruction manual). With this setup, the power response and top speed of the Frog are impressive for an out-of-the-box car. But remember, if you decide to change the gear ratio in your Frog, not only the pinion gear but the spur gear, too, must be changed to prevent irreversible gearbox damage. When making this change, be extra careful to make sure that the wire ring for locking the spur gear onto the drive gear is fully seated, or it could mean instant destruction. The manual is very good in providing you with all the pinion-to-spur combinations, so take your time and read this section of the manual carefully.

Suspension changes and adjustments are readily accessible and easy at track-side—a must for any top performer. The brass drive gear provides positive power to the gearbox, but if there's a weak spot in the Frog, it's certainly the aluminum bevel gears. Aluminum does, of course, help reduce weight, but using this soft metal at such a stressed point in the gearbox seems ill-advised. After a short time of track-testing the Frog, we noticed a faint gear-slipping noise, which was probably the result of rough driving and high jumping.

After an inspection of the gearbox assembly, it was determined that the half-shafts had done spline damage to the inside of the bevel gears. Replacement of the bevel gears was therefore necessary before returning the Frog to the track with a little less aggression in mind. The major damage resulted from the jumping exercises. When the buggy is airborne, the wheels and gears are under no stress, but when the car returns to the ground, for a split second there's a tremendous force

(Continued on page 182)

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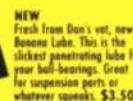
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RETURN OF THE FROG

(Continued from page 180)

on the gears, and it's at this point that the damage occurs. Whether this is due to the severity of our particular track test or a weakness in the car, time will tell.

Here's the address of the company featured in this article:

MRC/Tamiya, 2500 Woodbridge Ave., Edison, NJ 08817. ■

DIRT DIGEST

(Continued from page 169)

completely redesign the chassis, you can replace the standard front shocks and springs, and there are a few ways of doing it.

If you want to stick with the standard shock appearance, you can turn to Tamiya and CRP for assistance. The Bruiser uses a slim-profile shock absorber that has the same diameter as those in the Grizzly. (It's about 3cm longer, but that won't matter.) You'll need three parts from Tamiya: X-8819, the shock cylinder; X-8818, the cylinder cap; and X-9136, the piston and rod bag. From CRP, order two pairs of rear springs for the Frog (use the mounting ends from the original Grizzly shocks). The replace-

(Continued on page 184)

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DIRT DIGEST

(Continued from page 182)

ments should be filled with oil, which will help with the dampening, and the CRP springs are a little stiffer than the ones they replace. It should cost you about \$7 for each shock.

Alternatively, Hirobo uses a slimline, oil-filled, long shock absorber on the Alien. While this is about 2cm wider than the stock Grizzly unit, it does fit, and it increases suspension stiffness.

Neither solution will totally remove the tuck and roll of the front wheels, but you'll see a significant reduction. If you're handy with some .5-inch square spruce sticks, a drill and some screws, you can shore up the chassis from the front shock-mounting bar to the rear body stanchion (aluminum works better, but it's more difficult to work with).

Coming Up

Truck conversions are the big thing right now, and most use Tamiya Blackfoot wheels and tires. However, for a variety of reasons, they aren't always the best solution and, in fact, they can cause damage. Next month, we'll look at the reasons for this and at some possible alternatives. We'll also take a peek at the rear end of

(Continued on page 186)



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DIRT DIGEST

(Continued from page 184)

an Optima Mid to find out why you keep losing your rear dogbones, and Bob may even think of something to say about his Cat XLS, which has pleased and bewildered him since day one.

Finally, remember that we want to hear about *your* experiences with *your* cars. You don't have to come up with high-tech answers to problems, as we hope to be able to give you those, if you need them. We'd like to set up a grassroots information network where we can share the questions and the answers that can make the difference between running an efficient vehicle and a bookend! So pick up your pens, take to your typewriters, cajole your computers and *write!* We want to hear from you.

*Here are the addresses of the companies mentioned in this article:

MRC/Tamiya, 200 Carter Dr., P.O. Box 267, Edison, NJ 08818.

Tower Hobbies, P.O. Box 778, 1608 Interstate Dr., Champaign, IL 61820.

Custom Racing Products, 3250 El Camino Real B-3, Atascadero, CA 93422.

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Varicom Industries, 18480 Bandelier Circle, Fountain Valley, CA 92728.

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LETTERS

(Continued from page 14)

Drastic Plastic

Your November "Budget Boomerang" article mentioned one thing that's nothing less than dishonest and fraudu-

lent on the part of most manufacturers in this business.

These manufacturers, with all their great color ads and feature lists, and their (supposedly) bargain prices, know *full well* that the nylon bearings supplied in their kits are nothing more than *junk*,

and will have to be replaced with ball bearings in a very short time. For kids and parents on tight budgets, the extra \$20-40 is nothing less than a rip-off.

They ought to include the ball bearings in the kit, and show the increased kit cost right *up front*, and not market their products like a bunch of shysters. I know of no other hobby products that come to you with premeditated garbage. Many products do tell you what isn't included, and decent bearings surely fall into this "not included" category.

DICK SWARROUT

Penn Laird, VA

Dick, you're correct in saying that the plastic bearings included in many of the kits available are nothing short of "sub-standard." We'd like to see the kits come with some type of soft metal bushing, such as bronze bushings, which are much more tolerant to wear than plastic. Ball bearings would be the obvious choice, but use of the metal bushings would not only be an improvement over the plastic, but it would also keep the price of the kit within the range of those on a budget without tacking \$40 onto the price tag.

SP

(Continued on page 191)

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LETTERS

(Continued from page 188)

Confusing Cosmo

First, I'd like to say your magazine is totally cool and keep up the good work. I own a Kyosho Cosmo and I've been having a massive problem with my car. My drive shafts (or whatever you call them that come down from the gearbox to the wheels) keep popping out when I give it gas in forward or reverse. I've been through several pairs. I thought about ball bearings, but I'm not sure that would work, but what will? Please

help?!

JASON CUTTLE
Portland, MI

Jason, thanks for the compliments, "dude!" As far as the problem with your car goes, it's a very hard one to call. First, check the instruction manual and confirm that the suspension and drive system were properly assembled. If all is well, you may want to consider the set of ball bearings you mentioned. If the plastic bearings that are included in the kit are worn excessively, it may cause the parts they support, such as the drive shafts, to

move enough to allow the dogbone to fall out. Without seeing the car, it's very hard to diagnose. Your best bet would be to visit the local hobby shop so they can see the problem and give you a more definite answer. If they can't solve the problem, write back to me and I'll see if I can help you.

SP

If you're writing to the editors (and we'd love to hear from you), please be sure to address your letters to "Letters" Radio Control Car Action, 251 Danbury Road, Wilton, CT 06897. Only subscription orders and inquiries are handled by our Customer Service Department in Mount Morris, Illinois; other mail addressed there must be forwarded to Connecticut, which leads to long delays.

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